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**China's Cooperation, Conflict
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Viewed from Rummel's Field
Theoretic Perspective**

Hawaii University

**prepared for
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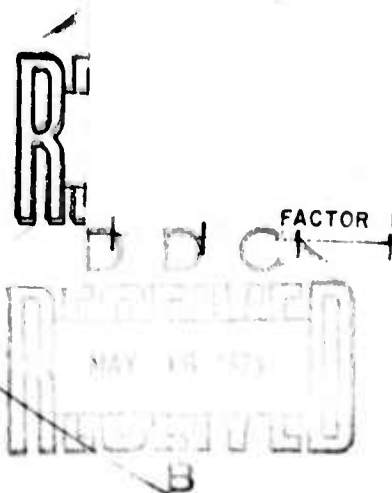
CHINA'S COOPERATION, CONFLICT AND INTERACTION BEHAVIOR; VIEWED FROM RUMMEL'S FIELD THEORETIC PERSPECTIVE*

Sang-Woo Rhee

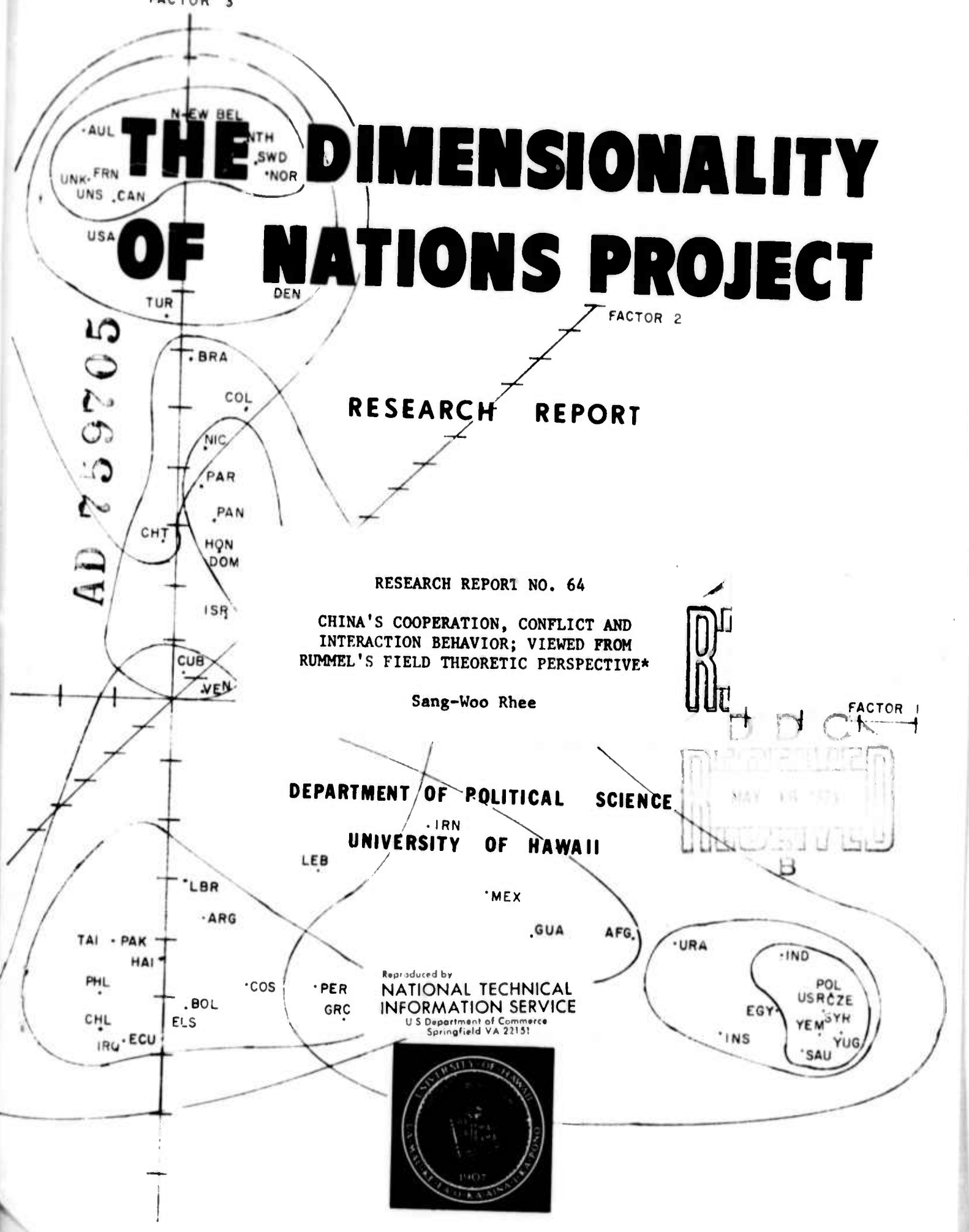
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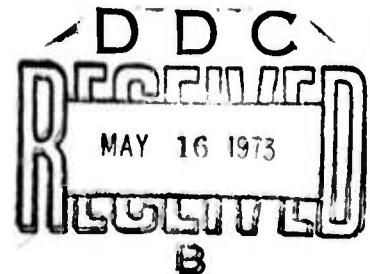
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13. ABSTRACT
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The period of study included sixteen years, 1950-1965. China's behavior toward all sovereign nations was measured with seventeen selected variables at five selected time points, 1950, 1955, 1960, 1963, and 1965. Then the data were factor analyzed with a technique called "Super-P factor analysis" which treated all dyads, including dyads consisting of the same actor and object for different years as separate dyads, in one matrix. As a result of this super-P analysis, six cooperative-type and two conflict-type behavioral patterns were identified.
The factor scores of the eight behavioral patterns were then canonically regressed on the factor scores of twelve factors generated from a factor analysis of sixty-nine attribute variables.
The results of the canonical analysis were very encouraging. We could delineate eight linear models each of which corresponds with each of China's eight behavioral patterns. Among these eight models, five proved to be useful in explaining and predicting China's actual behavior.

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China's conflict and cooperative behavior was examined from the perspective of Rummel's field theory which states that "the behavior of one nation toward another is a linear transformation of their differences from each other on their attributes."

The period of study included sixteen years, 1950-1965. China's behavior toward all sovereign nations was measured with seventeen selected variables at five selected time points, 1950, 1955, 1960, 1963, and 1965. Then the data were factor analyzed with a technique called "Super-P factor analysis" which treated all dyads, including dyads consisting of the same actor and object for different years as separate dyads, in one matrix. As a result of this super-P analysis, six cooperative-type and two conflict-type behavioral patterns were identified.

The factor scores of the eight behavioral patterns were then canonically regressed on the factor scores of twelve factors generated from a factor analysis of sixty-nine attribute variables.

The results of the canonical analysis were very encouraging. We could delineate eight linear models each of which corresponds with each of China's eight behavioral patterns. Among these eight models, five proved to be useful in explaining and predicting China's actual behavior. These were: the Chinese formal cooperation pattern comprised of diplomatic relations, substantial cooperation and administrative cooperation, which was explained by similarities and differences in bloc affiliation between China and other nations; the Chinese formal conflict pattern, measuring the Chinese level of manifested conflict behavior toward a nation, explained the power distances; the Chinese support of liberation war pattern which linked the object nation's geographical affinity to China and commitment by the object nation to neutralism; the Chinese Third World Politics pattern, which distinguishes out of the developing nations, those enjoying amicable government-to-government relations with China; and the Chinese substantial cooperation pattern, which is explained by the combined characteristics of the object nation's cultural, geographical, political attributes.

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I. INTRODUCTION

We know that in the near future, Nepal will not launch a military attack on China nor will the Union of South Africa attack Korea. With less certainty, we can say that China will neither attempt to conquer Japan, nor start a nuclear "Pearl Harbor" against the United States. With almost the same certainty, we can predict that China and India will not integrate themselves into a super nation.

We know all of these based on our common sense. Common sense is an amalgam of many bits of information and knowledge of the patterned relations among phenomena. For example, our common sense includes the knowledge that Nepal is militarily weaker than China and that no sane policy maker will initiate a war leading to certain defeat. Again common sense tells us that great geographical distance between two nations such as the Union of South Africa and Korea in general reduces mutual concern and a chance of war between them.

Sometimes, however, common sense leads us to a wrong judgement because some of the knowledge that comprise common sense is not systematically tested nor derived. The man on the street may think that the Communist Chinese have strong grievances against or hostilities toward Chiang Kai-shek.

But their publication Jen-min Jih-pao, scarcely mentions Chiang. Even when Chiang's guerrilla units attacked coastal villages and killed civilians, they blamed the Americans. Common sense alone is often insufficient to get a clear picture of what is going on, or especially, why it is.

China's foreign behavior has prompted numerous questions. Of all the Latin American nations, why has China shown the strongest interest in the Venezuelan revolutionary movement?¹ Why has she maintained good relations with Norway and Sweden, while concentrating her negative communications on the United States and Japan? Why did China opt for peaceful negotiations to settle conflicts with small neighbors, such as Afghanistan and Burma, while she relied on military measures with the big powers, such as India (border dispute), the U.S.A. (Korean War), or the Soviet Union (Kailashiang and other border disputes)?

In the past, many fine works have attempted to provide answers to the above questions.² With a few exceptions,³ however, they were

¹For example, frequencies of articles mentioning the Venezuelan revolutionary movement have been highest among all Latin American nations in 1965. Actual indices were Venezuela (7), Dominican Republic (5), Peru (2), Colombia (1), Honduras (1), and all others had zero values.

The study by Van Ness showed the same for 1965. For additional information, see Table 1 (p. 90), Table 4 (p. 148), Table 5 (p. 172) and Table 6 (p. 173) of his book Revolution and Chinese Foreign Policy, 1971.

²For a systematic review of past studies on Communist China's foreign behavior, see Sang-Woo Khee, "Communist China's Foreign Behavior: An Application of Field Theory Model II," 1971, Chapter II.

³Zobrov (1965, 1969), Greaser (1966), McClelland, et al. (1967), Smoker (1969), Sullivan (1964), Van Ness (1971), Zagoria (1962), and Zaninovich (1964).

either intelligence-collecting⁴ works or explanations without any theoretical frames.⁵ The available explanations are all based on educated intuition and expertise generated from long personal experience.

A non-theoretical approach, though it gives invaluable insights into China's behavior and sometimes very useful guides to predict her future behavior, has one fundamental deficiency compared with a social science approach or a theoretical approach. An atheoretical explanation lacks generalizability in application. An explanation is an intellectual enterprise that asserts understanding of relatedness among the classes of phenomena by providing a logical nexus between the concepts which represent those phenomena. A theoretical explanation consists of: a set of general laws, a set of initial conditions (both are explanans) and the event or phenomena to be explained (*explanandum*). It is the general law that links the initial conditions to the events to be explained, and provides us with the feeling of understanding.⁶

⁴Johnson aptly described a theoretical tendency of the study of Communist China: "much of the work already done on Chinese communism has been in the nature of intelligence-collecting rather than social research. This is neither surprising nor bad in itself, but intelligence compilation is not social science . . . Without the systematic application of social science theory to Chinese data, intelligence will provide only the most superficial aids to understand China . . . we must have theory-specific studies of Chinese politics in order to use even the data that we now possess and in order to generate newer and better theories" (Johnson, 1965, p. 258).

⁵Hinton, for example, clearly stated his antagonism against theory saying "I proceed on the basis of no general theory or political action: I find most such theories vague and pretentious . . . Nor do I employ any unique or complex method based on some such general point of departure. I prefer history . . . If there is a master key, it is context and educated intuition" (1966, preface, vii).

⁶For scientific explanation and theory, see Rudner, 1966, p. 60; Gregor, 1971, pp. 198-237; Kaplan, 1964, pp. 327-69; and Lieber, 1972, pp. 1-17.

Non-theoretical explanations do not provide us with any clear constructs⁷ between which the generalization is asserted, and thus we do not know whether the same form of explanation can be employed to other apparently similar events or phenomena. For example, China chose to peacefully negotiate her border dispute with Burma, and again with Pakistan. One explanation in the Burmese case was that the Chinese conceded some territory, but obtained equivalent concessions from the Burmese and thus, as a whole, from the viewpoint of national interest, lost nothing. This explanation seems to imply that if the Chinese will not lose much, they will negotiate peacefully. In the Pakistan case, however, a different explanation was given: China needed Pakistani help to deal with India. This seems to imply that from the greater context of international relations, i.e., relations with third-party nations, we can understand the peaceful attitude of the Chinese toward Pakistan. Then, are these explanations applicable to possible Chinese border disputes with North Korea or Outer Mongolia? It is doubtful because both explanations were not based on generalizations (implied generalizations were readers' supplements, and not an author's assertion) between clarified concepts and thus cannot apply to other cases. We do not know whether any two cases are similar without having common reference concepts.

Furthermore, without specific theoretical bases, explanations can be made only by those who have expertise on the context, history, and other relevant information of Chinese foreign behavior.

⁷A "construct" is defined as "a compound and/or complex abstraction, e.g., 'the state' or the 'presidency,' whose meaning is partially or exhaustively explicated in terms of concreta" (Gregor, 1971, p. 368). A construct "is not immediately susceptible of direct sensory observation, and in fact is no 'real' Constructs used in a theory must be defined for that purpose" (Willer and Webster, 1970, p. 749).

But suppose that we have a theory saying that a nation prefers peaceful negotiations to military measures with less powerful nations, and that she has the opposite attitude toward those more powerful. Then, an explanation based on this theory is general (applicable to any Chinese dyadic relations) and can be provided by anyone who can measure the power status of China and its counterpart.

Recently, several useful theories have been developed in the field of international relations.⁸ Among these, Rummel's field theory and status theory (Lagos, 1963; Galtung, 1966) are prominent in two senses: both are general enough to cope with various aspects of a nation's behavior within one theoretical frame and both are systematically organized to meet all criteria of scientific theories.⁹ Field theory especially is formulated with well defined constructs and has an explicit axiomatic and mathematical structure specifying the form of relations between a nation's international behavior and attribute distances. Both theories treat international relations as a social system in which interaction is a consequence of social forces.¹⁰ Status theory postulates

⁸For a brief outline of contemporary theories in international relations, see Lieber (1972), Dougherty and Pfalzgraff (1971). Also see Rosenau (1966) and Singer (1972).

⁹Detailed discussions of these two theories will be given in the following section. A scientific theory should at least meet the following four conditions: 1) there should be a set of statements (more than two) which are systematically related, 2) the statements should not contradict each other, 3) at least one of the statements should be a lawlike generalization, that is, empirically testable, and 4) the lawlike generalization should be derivable from other statements within the theory only with either a defined rule of deduction or generally accepted logic.

¹⁰The status theory referred to here is Rummel's reorganization of various theoretical arguments based on social stratification. See Rummel, 1971.

an individual or a nation's status as a basic behavioral force, while field theory defines attribute distances as the social force that determines a nation's behavior toward others. In this sense field theory is the first and so far the only general scientific theory developed specifically to deal with international relations.¹¹

If that is the case, then how useful is field theory in studying a nation's foreign behavior? What can we know by applying this theory in empirical research? The present study was designed to give a partial answer to these questions.

This study has two aims: first, the assessment of the validity of the major theme of Rummel's field theory¹² with China data; second, the development of an empirically applicable, general model of China's cooperation, conflict and interaction behavior based on field theory. Empirically applicable means that the model generated can be utilized directly to get information about China's foreign behavior. General

¹¹The following articles are helpful in getting comprehensive knowledge of the development of field theory. Rummel, R. J., "A Field Theory of Social Action with Application to Conflict Within Nations" in General Systems Yearbook, X, 1965, pp. 183-211; Rummel, R. J., "Field Theory and Indicators of International Behavior," The Dimensionality of Nations Project Research Report No. 29, Honolulu, Hawaii, 1969; Rummel, R. J., "U.S. Foreign Relations: Conflict, Cooperation, and Attribute Distances," in Bruce Russett (ed.), Peace, War, and Numbers, Beverly Hills: Sage Publications, 1972; and Rummel, R. J., "A Status-Field Theory of International Relations," The Dimensionality of Nations Project Research Report No. 50, Honolulu, Hawaii, 1971.

¹²The theory is still in the developing stage; parts of it, therefore, are continuously changing, with the newest version being called status-field theory. However, the major theme of the theory has been unchanged. Hereafter, field theory, if not otherwise specified means the one in Rummel, 1965, and status-field theory means the one in Rummel, 1971.

means that the model is applicable at any time point, under any circumstance and using any object nation.¹³

In this study, data were collected on measures of attribute distances and China's behavior toward all nations for five separate years between 1950 and 1965. Sixty-nine variables for attribute distances and seventeen behavioral variables have been selected, most of them from the variables list used by the Dimensionality of Nations (DON) project. Some variables, however, have been added to cope with China's unique perception and behavior, such as the percentage of overseas Chinese in the object nation's population, and Chinese attitude toward other nations as reflected in the Jen-min Jih-pao. In this study sovereign nations whose populations exceed 500,000 are included as objects of China's behavior.

II. THEORY AS A TOOL FOR SCIENTIFIC EXPLANATION

This study is an attempt to scientifically explain China's cooperation, conflict and international behavior with the help of a theory, i.e., Rummel's field theory. In the discipline of international relations, however, a theory is understood in many different ways.¹⁴ Depending upon their view on the role of a theory, political scientists will have different arguments on what will provide a better understanding of current international relations. Before discussing status-field theory, therefore, I will clarify my theoretical stance.

¹³Actually, the present study is an expansion of my previous one with the same aims (Rhee, 1971). Data points have been expanded from two (1955, 1963) to five (1950, 1955, 1960, 1963 and 1965) to investigate the relationship between the cross-time shift in both China's behavior and in the corresponding attribute distances.

¹⁴For example, see Rapoport, "Various Meanings of Theory," 1958.

2.1 Structure of a Scientific Explanation

In general, description and explanation are regarded as the two objectives of a scientific enterprise. Description, however, becomes a meaningful scientific exercise only when it serves as part of an explanatory scheme. Description as a cognitive enterprise means the intellectual recognition of inclusion and/or exclusion of certain phenomena within the class defined by a concept, a linguistic artifact. Explanation, on the other hand, means an intellectual enterprise that asserts understanding of relatedness among the classes of phenomena by providing a logical nexus between the concepts. Therefore, explanations presuppose concepts and descriptions with the relevant concepts. If there is no adequate concept that fits the explanatory scheme, new concepts may be created for the purpose.¹⁵

Description, by itself, however, by no means becomes explanation. Sometimes a concatenation of descriptions provides an explanation. In this case, however, it is an implicit explanatory scheme that constitutes the explanation, but not the descriptions per se. Therefore, descriptions that constitute parts of an explanatory scheme only become the objective of scientific enterprise. In this sense, we can say that the goal of science is explanation.

As a science, the chief objective of international relations is the explanation of phenomena occurring in the realm of inter-nation relations which originate from human behavior. What kind of explanation

¹⁵Willer and Webster distinguish these newly created concepts from ordinary concepts by calling them "constructs." For definition of a "construct" see footnote 7.

is most adequate? Before going into detail, I shall review some basic explanatory schemes popular in the discipline.¹⁶

According to Brown, explanation types which most political scientists utilize are:¹⁷ 1) genetic explanations "that provide a temporally ordered sequence of events that make the occurrence of the explanandum event intelligible," 2) explanations via intention "that invoke the actor's intention in order to render some human action," 3) explanations via reason "that advance an actor's reasons for undertaking some action," 4) explanation via dispositions that employ "dispositional terms, which permit comprehension of an action in terms of instantiating a tendency to behave in certain way," 5) explanation via function that "refer to the function of the explanandum event, illuminating its systematic purpose in a given context," and 6) explanation via empirical generalization "that appeal to empirical generalizations in order to subsume the explanandum event under a class of regular occurrences."

Though a detailed discussion of the merits and the deficiencies of each of the above explanation types is beyond the scope of this paper, I want to discuss one feature common to these six types. What makes the above explanations? It is none other than the underlying theories, whether implicitly assumed or explicitly cited, that allow us to accept a discourse as an explanation.

¹⁶My discussion will be limited only to the explanations that give answers to the "why questions" which scientists characteristically pursue. According to Gregor, the term "explanation" in ordinary language generally refers to four major types of cognitive activity: 1) coming to know the meaning of S; 2) coming to know how to do Z; 3) exhibiting the grounds of P; and 4) coming to know why P (Gregor, 1971, p. 199). It is the fourth type that scientists are pursuing.

¹⁷Brown, 1963, Part Two.

Let us take one example. Whiting explains why "red China did intervene when the North Korean cause seemed lost in the Korean War" by examining chronologically the events of the first four months of the Korean War.¹⁸

1. Throughout this time (the first month), domestic Chinese Communist progaganda repeatedly stressed, "the North Korean people have their struggle" . . .
2. No material assistance was given (in the first four months).
3. . . . it was not until mid August that Peking's first ambassador arrived in Pyongyang, seven months after the exchange of recognition.
4. In late September and early October, Peking notified the Indian ambassador that U.S. crossing of the thirty-eighth parallel would bring China into the war.
5. On October 7, U.S. forces crossed the parallel.
6. Chinese Communists "volunteers" began crossing Yalu.

From these ordered events, Whiting concluded that ". . . the sequence of Chinese Communist calculations and movements indicates that North Korean territory as such was not the issue. Rather it was the survival of a de jure North Korean regime which motivated Chinese Communist entry into the war."¹⁹

This type of explanation appeals to readers in general. The point I want to raise, however, is that it is not the concatenation of the events that makes his discourse an explanation. It is the theory or generalization presumed by the reader that makes it an explanation. Event 4 above (delayed arrival of Chinese ambassador at Pyongyang), for instance, requires readers to supply notions as "between friendly

¹⁸Whiting, 1960, pp. 73-75.

¹⁹Ibid.

nations, ambassadors are exchanged promptly after their recognition" or some equivalent, before it becomes a meaningful indication of the reluctance of the Chinese involvement.

Whiting further advanced his explanation of Chinese intervention in the Korean War as follows:

The communist element was paramount in these deliberations. American assurances of peaceful intent toward China were rejected as Machiavellian maneuvers of imperialism, bent on destruction of Communism and domination of Asia. Victory in Korea would only whet the imperialistic appetite for further 'adventures,' perhaps in East Europe, perhaps in China itself. America had already reversed its policy on Chiang Kai-shek, suddenly thrusting its Seventh Fleet between Communist and Nationalist armies. With General MacArthur's visit to Taiwan in August, and his expressed admiration for the Generalissimo, Mao Tse-tung had surface evidence reinforcing his assumptions concerning the imperialistic threat.²⁰

Again, this argument requires many implicit generalizations for it to be accepted as an explanation -- such as a psychological theory stating that "one favorable result (American victory in Korea) makes repetition of the same behavior more probable (victory in Korea would only whet the imperialistic appetite for further adventures)."

The logical backbone of explanations, therefore, are the generalizations (theory), whether expressed directly, or implicitly assumed. When the generalizations employed are assumed, however, some serious problems arise. First, there is no way to assess the objectivity of the explanation. No one can guess or refer to the same generalizations involved in the explanation when they are hidden. Second, if there is no specific rule connecting various generalizations into one meaningful logical array, no one can repeat the same explanation for the same phenomena -- it means that whether one accepts the explanation or not depends solely

²⁰Whiting, ibid., p. 75.

on that individual's feeling. In other words, though parts of the explanation may be theoretical, the explanation as a whole remains atheoretical.

The explanations via assumed theories (reader's feeling) can be accepted in daily conversations, but they cannot be scientific explanations that give us objective knowledge -- the "knowledge that is construed as logically independent of the particular state of mind of anyone who claims to possess it, independent, as well, of the society and culture of which its possessor is a member and of the psychic states of mind of any audience exposed to it and independent of anything other than the relationship between the proposition set conceived as embodying what is known and what is, in fact, the case."²¹

The only explanation we can use to generate objective knowledge is, then, a theoretical explanation consisting of: a set of general laws, a set of initial conditions (both are explanans) and the event to be explained (explanandum). It is the general law that links the initial conditions to the events to be explained, and provides us with the feeling of understanding.²²

One thing to be pointed out here is that the law connects theoretical constructs, but not the concepts themselves. Theoretical constructs are concepts which are specifically defined for the purpose of a theory. A construct is an abstract concept whose meaning is explicated in terms of concreta, or observable concepts.²³ In a deductive theory, the law specifies the form of relation between two constructs, one that is the

²¹Gregor, *op. cit.*, p. 205.

²²See Rudner, 1966, p. 60.

²³See Kaplan, 1964, pp. 55-6, 58. See also Gregor, *op. cit.*, p. 368.

condition, and the other that includes the explanandum. Then, through these generalized relations between the constructs, we can infer the relationship between a concrete event that fits the criteria of the conditional construct and another event contained in the class of events specified by the construct or explanandum.

From this analysis of a theoretical explanation, we can see that to explain means to subsume a unique event in more general categories which have specific relations between themselves. Therefore, logically, it is impossible to build a theory in terms of concreta (observable concrete concepts) alone, because by doing so, the theory will lose the very generalizability that provides the explanation.

2.2 Advantage of Deductively Derived Universal

In the social sciences generally, and in political science particularly, there have been very few scientific theories. One reason is that traditionally the primary concern of political science have been "unique" phenomena, unlike the nature sciences which have no interest in individual identities. For example, physicists search for the condition under which water boils -- water in general, not the waters of the Amazon or the Mississippi. But political scientists, instead of looking for general conditions for war between nations, ask "Why did China intervene in the Korean war?" So far as we focus our attention only on the uniqueness of events, it is impossible to formulate constructs which intrinsically deal with a collection of entities selected for similarities among the cases.²⁴ I repeat here that it is generalization that gives us an objective explanation and that generalization is only possible with

²⁴For further discussion on the comparison between individual-level studies and aggregate-level studies, see Rummel, 1972, pp. 72-6.

constructs built in abstract terms for a collection of entities. It is then obvious that generalization presupposes at least some collective concepts.

Another reason for the rarity of scientific theory in international relations may be attributed to disbelief in the inductive generalizations frequently adopted by social science. Frequently, political scientists tried to relate a symptomatic revelation of the phenomena, the supposed state of mind, or certain traits of behavior inductively with the hope that they could find high correlations among them. If they are lucky, they will have a model which represents a generalized coincidence between conditions and outputs. Nevertheless, the model is not explanative because the high correlation may be spurious, and the relation may not be a logical must.²⁵

An inductive generalization can also be considered as a universal, and thus function to explain and predict. But the scope of applicability is limited because induction alone does not provide the intra-relations among the concepts included in the universal statement. For example, from repeated observations, we can generate a universal that "things fall from a higher to a lower place" but observations alone do not provide us with the knowledge of logical nexus between the concepts "altitude" and "downward movement." Furthermore, we do not know under what conditions the universal is true.²⁶ Is it true only on the earth or will it hold true on

²⁵See Legg and Morrison, 1971, pp. 6-7. They argue that ". . . but there is always the danger that such hypotheses (inductively derived) are valid only under the conditions under which the observed phenomena occurred. Having only an inductive hypothesis, one has no idea of the limiting conditions under which the hypothesis will hold true."

²⁶For detailed advantages of deductively derived hypothesis over the inductively derived, see Legg and Morrison, *ibid.*, p. 7.

the moon, too? Induction alone cannot provide the answers. By the law of gravity, a hypothetico-deductive generalization, however, we know that the same universal statement is applicable on the moon, because the universal explicitly asserts that "falling" is due to a gravitational force generated among objects which have mass.

Knowing the logical system from which the universal is derived enables us to see even the effect of unobserved conditions on the phenomena in question. In the above example, for instance, we know that if the mass of the moon is different from that of earth, the velocity of the downward movement of the object on the moon must be different from that on the earth, since the law of gravity specifies the relation between velocity and mass. In international relations studies, where observations are usually limited to very few cases, this advantage of the deductive generalization is decisive.

2.3 On the Relation Between Universal Laws and Actual Behavior: Limitation of Theorization

It is ultimately important to gauge the practical limitation of theorization of human behavior when we formulate a new theory. As we have discussed above, the backbone of a theory is a universal statement relating one concept to another no matter how the universal statement may be derived. Generalizing from empirical instances is one way of arriving at theoretical universals. They may also be arrived at through intuition, imagination, insight, etc. In any case, however, the universal statement should be based on common attributes of either entities or phenomena, because, by definition, a universal presupposes generality across all possible cases of the same kind. Nothing on earth is the same as another to the last detail; it may share many attributes or characteristics with

others, but logically, still remains unique. A concept, a linguistic artifact, is formulated on the basis of some selected common attributes across plural cases. Therefore, a universal statement which defines the relationship between concepts, ignores the uniqueness of the cases. The level of generality of concept is determined by the purpose for which it is used.

To what extent can we theorize about human behavior in regard to international relations? What general theory can be applied to all nations on the earth? Though we cannot draw a clear demarcation line between the theorizable realm and the impossible realm, we know a limitation for a general international relations theory is where the commonness of all nation ends.

If we define a nation's foreign behavior as a reflection of human decisions made by the nation (mainly the decision maker, but also sub-units or individuals), then, there must be innumerable factors affecting the decisions including both the characteristics of a nation common across all nations and the unique conditions specific to the nation. Therefore, it is impossible to formulate a general theory to cover all of a nation's foreign behavior. As a result, we cannot explain and predict an event or a particular behavior with a general theory. Questions such as "Why did North Korea invade South Korea on June 25, 1950, instead of July 7, 1951?" or "When will Chou En-Lai visit Canada?", thus, are unanswerable by the theory.

What a general theory tells us is some basic laws that govern the sub-structure or Unterbau of international relations. The actual behavior of a nation is based on this sub-structure with many additional other unique factors. Thus, the final behavior may depart from what we expect

based on a general theory alone. The Unterbau, however, defines the range or boundary of decision choice, beyond which the behavior cannot deviate. The relation between a general law of international relations and actual behavior is like the relation between the law of gravity and the actual movement of an object on the earth's surface. Before examining the terrain, we cannot say whether the waters of Lake Winnipeg will flow into the Hudson Bay or into the Atlantic Ocean. But the law of gravity leads us to assume that water flows from a higher place to a lower one. This law delimits the possible alternatives for the actual location of the waterway.

In international relations, the role of a theory is exactly the same. We can easily say that in the next ten years, Nepal will not invade China with military forces or Bolivia will not have a war with Yemen, without any consideration of the ideology of the decision maker or some other important factors, because we know that an extremely unfavorable power disparity in one case and great geographical distance in the other will prevent such wars. In other words, we know that laws such as "large discrepancies in military capacity discourage a weak nation from initiating military attacks against a strong one" or "geographical distance hampers the will for war" did not allow for decision makers any other choice. What political scientists are doing is expanding beyond common sense the realm of a nation's behavior that is governed by such basic laws. Good theories narrow the range of the unexplainable portions of a nation's behavioral variation, and allow better explanation and prediction of a nation's foreign behavior.

Then, practically, when we are theorizing in international relations, where can we draw a demarcation line between the variance covered by the proposed generalization and the variance excluded as the unique part?

In social field theory, the line is drawn analytically between the part of variance in total behavioral variance left for the actor's free will and that governed by a bio-eco-cultural field force.²⁷ In field theory, behavior is viewed as a consequence of biological, ecological, and cultural field forces exerted on the actor in the field and the actor's free will. These forces are in the nature of distances (to be discussed later) and determine the actor's behavioral dispositions. Free will is independent of these dispositions and an aspect of the actor's moral judgement.

We can illustrate the relations in the following equation:

$$\text{BEHAVIOR} = f(F + B + E + C)$$

where F means Free Will; B, biological field forces; E, ecological field forces; and C, cultural field forces. If we can determine the field forces that include all these factors, then only the variance resulting from free will will be left as the unique part.²⁸ And if we can assume some part of B, E, or C as unchanging for a certain duration of time, then that part will be regarded as constant in the model for the time being. For example, if there is no variation in the biological impact across all actors, then the B will be constant in the above model. On the other hand, if we do not treat it in our theorization, then part of behavioral variance affected by B will be included in the residual.

²⁷This idea was conceived by Rummel. A fully developed philosophical argument on this issue will be included in Rummel, Forces of Man, Conflict and War (tentative title), now in writing.

²⁸This left-over part will be the residual variance after we subtract the variance accounted for by the field theory model from the total behavioral variance.

Thus, in practice, the direction of our theorizing effort is to reduce the residual as far as possible by adding more generalizations on the right side of the equals sign in the above equation. It is a continuing effort of exploration of unexplained portions of behavioral variance based on the previous work. The unexplored part, then, will constitute the outer boundary within which the left-over factors will operate.

Status-field theory as a general theory helps us to understand some important aspects of the Unterbau underlying the actual behavior of nations. Therefore, discrepancies between the prediction based on status-field theory and actual behavior may be found. Such a discrepancy can be a sign of the existence of other factors which are not contained in the model. And another auxiliary theory which will explain the relationship between the deviated variation of the nation's behavior and the supposed factors can be formulated in the next step of theorization process.

III. RUMMEL'S SOCIAL FIELD THEORY

Philosophically, Rummel's social field theory is based on the concept of the world as a field. Rummel views social reality as "a field consisting of the attributes of social units and their interactions. Attributes are those characteristics by which a social unit can be differentiated from all other social units. The behavior that social units direct toward each other are their interactions (Rummel, 1968a, p. 26)."

Theoretically, Rummel's social field theory is rigorously structured. Based on well formulated axioms, it postulates a law

which defines the form of interrelationship between the behavior of a social unit and the relative attribute differences of that social unit from others. The heart of the theory is the basic mathematical equation representing the model of the relations defined by the above law. The analytic system employed is linear algebra, and many constructs in the theory are expressed in terms of linear algebraic concepts.

In the following (Section 3.1, 3.2), I shall discuss both the concept, field, the core of field theory, and the concept, distance, introduce the model (Section 3.3) and discuss an extension of field theory, i.e. status-field theory (Section 3.4).

3.1 Field as an Analytic Schema

As Rosenau succinctly pointed out, the basic reason for retarded theorization in international relations is the lack of an overarching analytic scheme which links partial theories into one general theory.²⁹ Without such a grand scheme, it is almost impossible to understand the whole of international relations no matter how many excellent partial theories may have been developed. It is similar to a situation where a microscopic analysis of each tree in the woods fails to lead to any conception of the woods as a whole.

In international relations, a nation's behavior is affected by an almost infinite number of factors; various domestic forces, the nature of the decision-making apparatus, psychological factors of the decision makers, contextual constraints generated from the state of the broader system in which that nation belongs, and so on. Each theory with well-selected variables may explain one aspect of the total international

²⁹See Rosenau, 1966, p. 32.

relations system, if the theory can successfully control the effect of excluded variables. But as in a jigsaw puzzle, without a grand analytical scheme we cannot discover the missing pieces between the explained portions of the international relations terrain and the unexplored parts.

One important merit of the construct "field" can be found in its role as the overarching analytic conceptual scheme for individual theories. As Lewin described it, field theory is distinguished from other theories in its scope.³⁰ Lewin said: ". . . instead of picking out one or another isolated element within a situation, the importance of which cannot be judged without consideration of the situation as a whole, field theory finds it advantageous, as a rule, to start with a characterization of the situation as a whole. After this first approximation, the various aspects and parts of the situation undergo a more and more specific and detailed analysis. It is obvious that such method is the best safeguard against being misled by one or another element of the situation."

An analytic conceptual schema is "a conceptual schema composed of sets of definitions conjoined with a set of analytic or logically true sentences."³¹ In Rummel's field theory, field is the conceptual schema which provides the overarching structure within which all theoretical statements of the theory are spanned. In status-field theory (equivalent of field theory axioms 1, 2 and 3), field is defined by the following two axioms.

³⁰Lewin, 1972, p. 521.

³¹Gregor, op. cit., p. 367.

Axiom 1: International relations is a field consisting of all nation attributes and interactions and their complex interrelationships through time.

Axiom 2: The international field comprises a Euclidean attribute space defining all nation attributes and a Euclidean behavior space defining all nation dyadic interactions.

Axiom 1 defines the three basic concepts which constitute the field: nations, nation attributes, and between nation interaction (behavior).

First, nations are the units of analysis in field theory (as well as in status-field theory). In international relations, there have been continuous controversy on what unit should be elected as a basic research unit.³² The problem actually lies in the definition of the term international relations. How can we define international relations? McClelland suggests that "international relations is the study of interactions between certain kinds of social entities, including the study of interactions between certain kinds of social entities, including the study of relevant circumstances surrounding the interactions."³³ Note that he did not specify the actors of interactions but left it open by saying "certain kinds of social entities." But considering that the phenomena we are studying is interaction between social entities across national borders and that interaction means a consciously determined action toward other entities and that, empirically, sovereign nation states are the only existing units which can control the interaction at this moment of history, we must conclude that nations

³²See Singer, 1969.

³³McClelland, 1966, p. 18.

should be the "certain kind of social entities" whose mutual interaction comprise the domain of our study.

Some may argue that international organizations and individual persons be recognized as the actors in international affairs in certain cases.³⁴ Even though both international organizations and individuals sometimes have locus standi in international courts and considering that international courts and some international organizations have the right to sign treaties with nations, they nevertheless have not the general capacity to determine their interaction with other units. In this context they cannot be regarded as the basic unit of analysis in international relations. At this point in time in history, we can decompose the actions of international organizations into those of member nations, and the actions of any entity within a nation into those of the nation since the actions are all controllable by the national government. In short, nation states are the only de facto subjects of the international system though there exist some de jure subjects other than nation states.

Thus, we may take nations as the basic unit of analysis in the study of international relations and a field that comprises only nation actors is quite acceptable.³⁵

Now let us move to the other two basic concepts -- attributes and behavior. An attribute is a construct which characterizes the uniqueness of nations. An attribute is defined by Rummel as "any description differentiating nations, like GNP, population, and area."

³⁴See Lee, 1958, pp. 53-69.

³⁵Field per se has nothing to do with the unit of analysis. We may construct a field of individual persons, or that of nation groups.

The term attribute defined here is a general abstract concept that includes all possible variables that can differentiate one nation from others, no matter what aspect of nation characteristics they may measure.

Interaction between nations is called behavior. Behavior is defined as any action of one nation (actor) toward a specific other nation, which then relates the two. Two such nations form a dyad and the action involved is a dyadic behavior. Actions of nations which do not aim at a specific object nation, therefore, are excluded. But it does not narrow the scope of field theory from that of international relations in general, because by definition the domain of international relations only includes interactions between nations and already excludes that nation behavior without any nation target. The term behavior again is a general abstract construct which is operationalized by all variables that describe a nation's action toward the object nation.

When we use the nation as a primary unit, the theories in international relations, whether they are simple or complex ones, must include propositions explaining how a nation's behavior is determined. What can serve, then, as the determinants of national behaviors?

First, without any doubt, we can think of domestic forces which are "the wellspring of the state's inter-nation behavior."³⁶ If we define behavior as a "consciously determined action with aim," it is a logical necessity to acknowledge the nation's characteristics or attributes as an important cause of the behavior, because the aim

³⁶See Guetzkow, 1964, p. 56.

comprises the needs and motivations of the actor and, the needs and motivations are a reflection of the actor's characteristics. Thus, for Rummel, a basic proposition is that "the total behavior of a nation is dependent on or related to the attributes of the nation" (attribute theory).

The second explanation for nation behavior is the difference in national characteristics between the actor and the object nation. The major argument for this explanation is that action (movement) can be generated only when there are differences in the static forces exerted on two spots, and it can be said analogously that the difference in attributes generate the force difference. This idea is well developed in various field concepts and serves as the foundation of Rummel's field theory.³⁷ This will be discussed further in the next section.

The system context within which nations behave serves as the third explanation. The state of the system at the time when a nation behaves toward a specific object nation becomes a conditional constraint on the actor nation. For example, when the U.S.A. decided to withdraw her troops from Vietnam, the dispersion of nuclear weapons among other nations, China's huge army, and the Russian threat to Europe might all have influenced the decision even though they are not directly related to the binary relation between the U.S.A. and Vietnam.

The above three types of theories should subsume all theories in international relations so far as nation behavior is taken as the dependent variable.³⁸

³⁷See Rhee, 1971, pp. 34-42.

³⁸As I mentioned elsewhere, the field can be also defined as a bio-eco-cultural one. This means that field forces are generated from

Now, let us re-examine the third type of theory. The international system consists of all nations and the transactions among them. The state of the system, or the system context, means the interrelated linkages among the nations. This implies that we can reduce the system context into mutually interlocked binary linkages. Each binary linkage can be described in terms of both the attribute distance (objective relations) and the dyadic behavior (subjective relations built by the actor's commitment). Thus, we can also express the propositions of the theories which use the system context in terms of attribute and behavior.

With the three basic concepts -- nation (all units on earth), attribute and behavior -- we can conclude that the field theoretically envelops all descriptions of nations and all interactions among nations. Field so defined, thus, provides a universal domain that contains all possible linear theoretical arguments in the international relations discipline.

Axiom 2 defines the structure of the field delimited in the first axiom. The axiom says that the field is composed of two Euclidean spaces, one for the attribute part, the other for the behavior part.

biological factors (internal physiological condition of the actor), ecological factors (external physical conditions) and socio-cultural conditions (patterned regularities produced by accumulation of previous human behavior: value tradition, institution, mode, customs, law and other social norms, etc.). The two classifications of factors are based on different criteria, and it does not mean that the three groups of factors mentioned in the main text are not exhaustive. For example, most of the biological factors are included in the actor's attributes, and in another way may work as system context and so on. The only factors actually excluded is free will. As explained briefly in the previous section, the current field theory model deals only with dispositional behavioral conditions and thus free will, which is by definition unique to actors and independent from other factors, cannot be tapped in the model.

In the attribute space, nations are represented by points in Euclidean space where all possible attribute variables are contained in vector form. In this space, we can describe the relative positions of nations vis-à-vis variable vectors, as well as the interrelationship among the attribute variables (in terms of the size of the angles between vectors).

In a similar way, in the behavior space, all nation dyads are represented as points and the behavioral variables as vectors. Again, the interrelationships among the variables are described by the angular measures between the vectors.

This axiom has two significant theoretical implications. First, with simple mathematical constructs like point, vector, and angles, complex interrelationship among various concepts can be described simultaneously, neatly and rigorously.

Secondly, the axiom opens a path linking the conceptual world of international relations to that of linear algebra with its well-developed analytical deductive schemes. Defining nations and nation dyads as points and attributes and behavioral variables as vectors in Euclidean space, the axiom incorporates linear algebra as a part of the theoretical framework of field theory. This means that international relations theorems based on the concepts defined by the axioms of field theory can be deduced via linear algebra.

For example, we know empirically that a nation's GNP, population size, size of army, number of telephones per thousand population, and literacy rate are mutually related. Also, we, with some hesitance, can say that there may be one or two basic variables underpinning all these others. Once each variable is represented by vectors in a Euclidean space, however, the above speculation can be easily cleared up with

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factor analysis, a well-developed algebraic model. All derivations that are correct in the linear algebraic system, are also applicable to the original international relations inquiry.

So far, we have discussed the inner structure of the field. Then, what advantages do we have using a field concept in studying international relations? Among others, the following three are prominent.

First, theoretically, we can cope with all linear variations in nations attributes and behavior simultaneously. One problem we frequently encounter when we are modeling a nation's behavior over some selected attribute variables is that we do not know how much of the possible variations in behavior are included in our model. In Rummel's field theory, the fields are exhaustive, leaving no variations untapped.³⁹ The behavior of a nation, i.e., the movement of a nation point in the field is the function of the intensity of field force exerted on that point, which is the combination of all possible forces on that spot combined. Field, thus, serves as a contextual reference with which a model is compared to gauge to what extent of the possible variations it covers.

Secondly, field defined as a Euclidean space with nations as points and variables as vectors, provides us with a clear configuration of the interrelationship among variables and nations in an exact and rigorous form. Field concepts are not new. Maxwell in physics, Lewin in psychology, Wright in international relations have used the concept.⁴⁰

³⁹The exception is the variation produced by an actor's free will, which is unique to the actor. For further discussion, see the next section.

⁴⁰For a brief discussion of each of these field concepts, see Rhee, op. cit., pp. 34-42.

But it is Rummel's linear algebraic field that gives us these nice facilities. Interrelationship among variables being represented by the angles, the field space can accommodate a complexity of interrelations between concepts in international relations neatly no matter how many variables may be involved, since theoretically there is no limit to the dimensions in the space or the number of variables we may deal with.

The third advantage of field as a theoretical framework is the generality of the concept. The concept field is an overarching conceptual framework within which all nation attributes and behaviors are accommodated. The field concept itself does not specify the kinds of variables to be included; it only provides the relationship among variables once they are included. One notorious problem in international relations studies (as well as the social sciences in general) is the fragmentation of the individual studies, that is, the lack of connection among studies. For example, one study reveals the role of power discrepancies between two nations in determining the characteristics of the verbal conflict between the nations, while another finds that the level of economic development plays a great role in causing between-nation conflict. Or, one international relations theory tells about mutual cooperation while another clarifies the relationship between power and conflict. In these cases, we could not get the overall picture of international cooperation and conflict unless we had a grand theory which would accommodate all these findings as its parts. Field concepts provide this overarching frame. With this capacity to place each research finding within a larger context, the field concept can be compared to the coordinate system in Cartesian analytic geometry.

3.2 Distance as a Construct

In the field theoretical notion, the most important construct is "distance." As we have discussed above, in the field, all entities (nations) are placed as a point, and are differentiated from other entities by the relative distances between the points.⁴¹ Distance is, therefore, the essential concept for the structure of a field.

The importance of distance, however, is its role in explaining the movements of the entities (nation's behavior) in the field. In Rummel's status-field theory, it is axiomized that "between nation attribute distances at a particular time are social forces determining dyadic behavior at that time" (Axiom 4).

The field concept includes the notion of strength or intensity. Every point in a field has unique forces acting upon it. These forces are determined by the field in the immediate neighborhood of the point. In Rummel's structure, the behavior of a nation toward a specific object nation (movement in the field) is caused by the field force acting upon the point the dyad occupies in the behavior space; the field force (social force) is determined by the aggregate sum of attribute distances between the actor and the object.

How do we define distance in the field? Rummel defines distance as the difference in value between two nations on an attribute dimension. All attribute variables are attribute dimensions if they differentiate nations by that measure.

The underlying idea of field forces being generated from the attribute distances is that in international relations there are fundamental

⁴¹More rigorously speaking, in field theory it is distances that factually exist, and the positions are calculated from the interlocking distances. See Eddington, 1957, pp. 6-10. Similar arguments can be found in field theories in physics.

conditions that force a nation into a reaction with a limited range of deliberation. Consider the effect of power distance between nations. Anyone can argue that Nepal will not attack China militarily in the next ten years for Nepal has no power to do it. The great discrepancy between the two nations on the power dimension provides a fundamental condition for the Nepalese decision makers to limit their deliberations (here, no alternative). The imaginary conflict between Bolivia and Yemen is another example. With no naval power and weak air power for Bolivia, geographical distance is the ultimate preventive condition for Bolivian attack on Yemen. In this way, we can translate the conditions that delimit a nation's behavior into attribute distance terms.

In field theory, all these attribute distances are accommodated as vectors in a space with the aid of the linear algebra, and the relative contributions of the attribute variables and the relationship among them can be measured clearly and simply.

One thing, however, should be mentioned in regard to the distance concept. The field force generated from the attribute distances only serves as an environmental condition under which leaders decide the nation's policy. It does not directly cause the nation's behavior. This force is linked to the final behavior via human deliberation. The force, in short, binds the human decision within certain limitations. Statistically, the force explains part of the variance in a nation's behavior, leaving room for human factors. Some portion of the left-over variance then will be covered by another model or construct which deals with human psychology.⁴²

⁴²Although Rummel regarded the field theory model as a "complete" one for a nation's behavior and did not leave any room for other human factors, I think we must understand that the model provides only the

In other words, field forces determine the dispositional direction and magnitude of the behavior -- the actor, however, may choose other behaviors.

3.3 Basic Model of Field Theory

As we have discussed above, in field theory the basic statement (lawlike generalization) on a nation's behavior is "between nation attribute distances at a particular time are social forces determining dyadic behavior at that time" (field theory axiom 5, and status-field theory axiom 4), or more rigorously, the distance vectors in attribute space that connect nations are social forces determining the location of dyads in behavior space.

The fundamental linkage between behavior and attributes proposed in field theory is

$$w_{i \rightarrow j, k} = \sum_{l=1}^p a_l d_{i-j, l} \quad (1)$$

where $w_{i \rightarrow j, k}$ is the k -th dimension of B-space and $i \rightarrow j$ is a particular dyad, nation i is the actor and nation j is the object. The term $d_{i-j, l}$ is the distance between i and j on the l -th dimension of A-space.

1) The term $d_{i-j, l}$ is the distance vector from nation i to j on the l -th attribute dimension. If we define nation i 's value on the l -th coordinate as $a_{i, l}$ and nation j 's value as $a_{j, l}$, then,

basic conditional boundaries for decision makers. The force generated from attribute distances cannot be directly related to a nation's behavior; it must be relayed by human beings -- decision maker's perception and decision framework. In Guetzkow's words, then, we need another kind of theory which deals with the nature of the nation's decision-apparatus which translates the basic forces into "foreign policies" (Guetzkow, 1964, p. 56). In status-field theory, the construct "status" partly covers this part. See II-4 of this paper.

$$d_{1-j,t} = a_{j,t} - a_{1,t} \quad (2)$$

For example, China's GNP in 1962 was 42 billion U.S. dollars, while Japan's was 77 billion.⁴³ In this case, the distance from China to Japan on the GNP dimension is calculated as

$$d_{\text{China-Japan,GNP}} = 77 - 42 = 35 \text{ (billion dollars)}^{44}$$

In a similar fashion, we can calculate the distance from China to Japan on other attribute dimensions: population distance = -484 million, steel production distance = 17 million tons,⁴⁵ and so on. Field theory axiomizes that each of these distances are the components of the force vector that makes a nation behave in a certain way.

2) Next, the term α_i is the weighting parameter of each attribute dimension. Each attribute distance may have a different impact on the decision-makers of different nations. For example, the Chinese may be very concerned about their economic distance from other nations, while regarding the religious distances (differences) as trivial. Each α_i is the specific scalar weight for each of the different attribute distances.

3) The symbol Σ denotes that we need to sum all attribute distances (differently weighted) in order to calculate the resultant force which is exerted on the nation to determine her behavior.

4) Finally, the term $v_{1 \rightarrow j,k}$ represents one of the elements of the vector of nation 1's behavior to j on the k -th behavior dimension in

⁴³Eckstein, 1966, p. 249, Table 7-1.

⁴⁴In the actual research, both A- and B-spaces are factor analyzed, first. The factor scores are then used as the values of each unit on factor dimensions. Therefore, d , the distance between $a_{1,t}$ and $a_{j,t}$ measures the differences in factor scores. The raw differences are given here to clarify the concept of distance.

⁴⁵Both figures are from the UN Statistical Yearbook, 1965.

B-space. In field theory, as we discussed above, the unit of nation behavior is defined as a dyad, a pair of nations, one of which directs her behavior toward another (with our notation $i \rightarrow j$, the nation i is the actor, and j is the receiver). For example, the fact that China gave 50 million dollars of economic aid to North Korea (1955) is expressed as

$${}^v \text{China} \rightarrow \text{N. Korea, economic aid} = 50 \text{ million dollars}$$

Equation (1) given above is in scalar form. That means we take one general element from the left side and one from the right side and express the relationship between them, or in other words, the equation denotes only one dyadic relationship. If we express equation (1) in matrix (vector) form, i.e. for all m dyads, it becomes

$$w_{mx1}^k = D_{mxp} P_{px1} \quad (3)$$

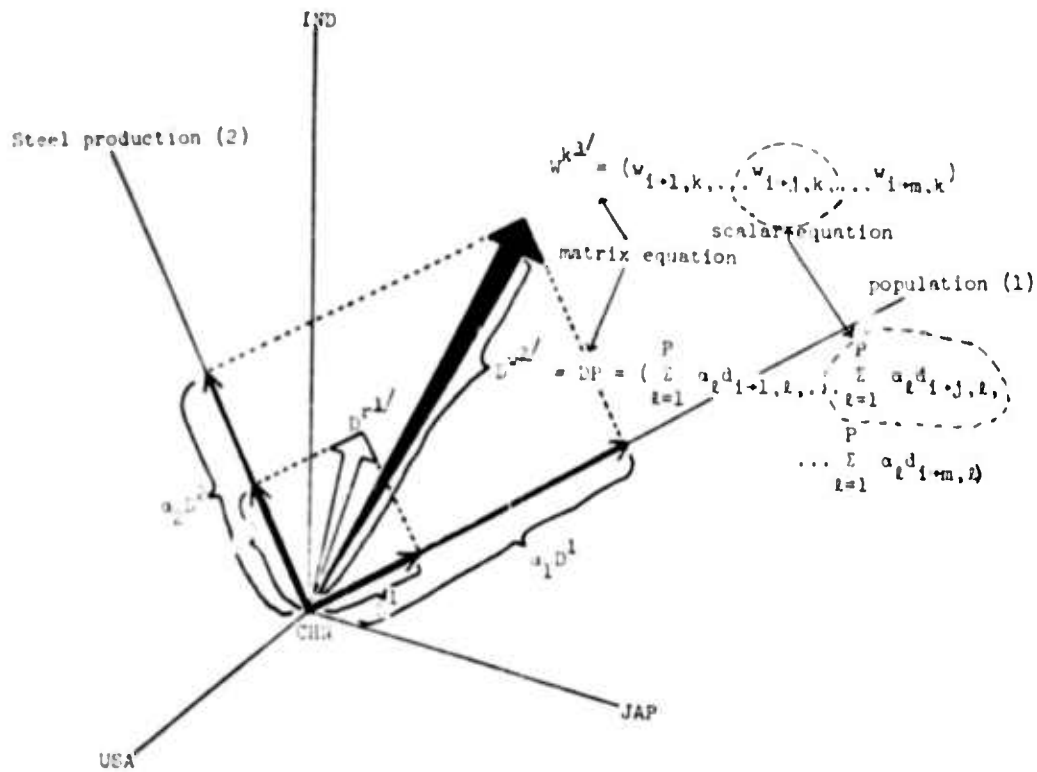
where w_{mx1}^k is the k -th dimensional behavior vector of B-space which is composed of the same behavior of all m dyads; D_{mxp} is the matrix of the distance vectors, each column of which represents an attribute distance vector for m dyads; and P_{px1} is a set of p weighting parameters each of which corresponds to an attribute vector.

If we define D^v as the weighted resolution vector of all vectors in D where each vector is weighted by corresponding α_l weights, then,

$$w^k = D^v = \sum_{l=1}^p \alpha_l D^l \quad (4)$$

where D_l is l -th vector in D .

Geometrically, the basic equation of field theory can be illustrated as in Figure 1. Here, the location of China's position is taken as the origin of the coordinates. (In general, any point in attribute



1/ D^l = resolution vector of D^l

2/ D^v = resolution vector of weighted D^l ($a_l D^l$).

$$D^v = DP = a_1 D^1 + a_2 D^2 + \dots + a_l D^l + \dots + a_p D^p$$

Therefore, the first term of D^v is $a_1^d \dots + a_2^d \dots + a_l^d \dots + a_{k+1}^d \dots$
 $\dots + a_p^d \dots = \sum_{l=1}^p a_l^d \dots$, and the j -th term is $\sum_{l=1}^p a_l^d \dots$

3/ w^k = k -th vector of W . The j -th element of w^k is $v_{i+j,k}$.

FIGURE 1

GEOMETRIC EXPRESSION OF THE BASIC EQUATION OF FIELD THEORY

space may be chosen as the origin. The relative distances among all nation points are not affected by the choice of the origin.) There are q dimensional vectors in W and each of them are related to D^W in the form of equation (4). If we express all the equations as a single equation, we would have

$$W_{mxq} = D_{mxp} P_{pxq} \quad (5)$$

where W_{mx1}^k is one of the column vectors (k -th vector) of W_{mxq} .

There are two different models developed by Rummel according to the different interpretations of the weighting parameters. In Model I, the parameters are the same across all the actors. This implies that the unique experiences and capacities of each nation and the structures within them are irrelevant to her behavior. In other words, a nation's responses to the various kinds of distances are the same as all other nations. Furthermore, it implies that the behavior of nation i to j is the exact opposite of the behavior of nation j to i .⁴⁶ This obviously contradicts common sense.

In Model II, the parameters are unique to each actor nation; thus the impact of each of the attribute distances on behavior differs according to each nation. This is the point where each nation's intelligence can be geared in. Thus, for example, if China's attribute distances from other nations were the same as India's, the impact of these distances on her foreign policy still will differ from India's, due to her unique perceptual framework. For this reason, Model II is preferable to Model I. In Model

⁴⁶"Recall that a distance vector for nations i and j is a difference. Thus, when we reverse i and j we only reverse the sign on the distance vector. Then, the behavior of i to j will only differ from j to i in the sign, and not the absolute value" (Rummel, 1969b, p. 18).

II, the equation that links behavior and attribute difference is,

$$w_{i \rightarrow j, k} = \sum_{l=1}^p \alpha_{il} d_{i-j, l} \quad (6)$$

Here, α_{il} has replaced α_l in the equation of Model I, equation (2).

In matrix form, the equation is

$$W_{mx1}^k = D_{mxp} P_{px1}^i \quad (7)$$

and for all q behavioral vectors together,

$$W_{mxq} = D_{mxp} P_{pxq}^i \quad (8)$$

where P_{px1}^i and P_{pxq}^i are unique weighting parameters which represent each nation's idiosyncratic decision-making system. For convenience the superscript i will be dropped, since this study will deal with only one actor, China. Then, the complete model with residual matrix U inserted will look like

$$W_{mxq} = D_{mxp} P_{pxq} + U_{mxq} \quad (9)$$

Hereafter, when I refer to field theory, it will be Model II, if not specified otherwise.

Theoretically, this formulation would tell us that a particular behavior (e.g., negative communication) is explained by a certain subset of attribute distances (e.g., GNP, political distances, etc.), while another behavior (e.g., economic aid) is mainly explained by another set of distances (e.g., number of Communist party members, steel production, etc.) without specifying the interrelationships between these individual behaviors (e.g., negative communication and economic aid).⁴⁷

⁴⁷For detailed discussion of this model, see Rhee, 1971, Chapters III and IV.

In this model, the weighting parameters P may be understood as the actor's unique "decision-framework" which represents the combination of both the perceptual framework and the system of behavioral choice, since this is the only set of parameters which indicate the actor's idiosyncracies.

When we apply this model to an empirical study, we need to evaluate the P matrix of equation (9). Since this model requires an analysis of the relations among a single criterion measure (k -th behavioral vector) and two or more predictor measures (p attribute distance vectors), the value of P can be determined by employing the least-squares estimation technique, a standard solution of a multiple regression model which will provide the best unbiased estimate of W^k .⁴⁸ This formulation (equation (9)) is called the multiple regression model of field theory (MRM).

Another version of field theory Model II is the canonical regression model (CRM). In brief, the basic difference between the two is that instead of relating individual vectors (k -th vector = W^k) of B -space to the resolution vector of the weighted distance vectors of A -space (D^W) in the form of a multiple regression, in the canonical regression model (CRM) the weighted resolution vector of q dimensions of W (B -space basic dimensional vectors) is related to D^W .

The scalar equation of the new model, then, is

$$\sum_{k=1}^q \beta_{ik} W_{i+j,k} = \sum_{l=1}^p \alpha_{il} d_{i+j,l} \quad (10)$$

where β_{ik} is the weighting parameter of the k -th behavioral dimension of W . In matrix form, the equation is

⁴⁸For the conditions and mathematical derivations for the solution of the multiple regression model, see Johnston, 1963, pp. 108-115, and Cooley and Lohnes, 1962, pp. 31-35.

$$W_{mxq} Q_{qx1} = D_{m xp} P_{px1} \quad (11)$$

where Q_{qx1} is the matrix of β parameters for all q dimensions.

Technically, we are forming two composite variates, variate (V) out of p distance dimensions of D , weighting each p dimension by P , and variate (Y) out of q dimensions of W , weighted by Q , and, then relating these variates. This relationship is illustrated geometrically in Figure 2.

Theoretically, with this model, the parameters of P are the actor's unique perceptual framework of attribute distances,⁴⁹ which is formulated by its historical background, value system, cultural heritage, etc., and the parameters of Q the unique behavioral framework or system of behavioral choice which differently emphasizes each behavior when given forces are applied.

To apply this model to China's behavior, we must evaluate both P and Q empirically, or solve Q and P of the following equation

$$WQ = DP + U \quad (12)$$

or

$$Y = V + U \quad (13)$$

⁴⁹Note that by a unique perceptual (or behavioral) framework, it is not meant that an actor has only one such framework. It means that an actor has a set of frameworks, each one for a particular behavior pattern. For example, to determine the intensity of negative communication toward an object nation, the actor may be guided most by distance while for a trade behavior, it may show the greatest sensitivity to the distance in economic development. If we use canonical regression analysis to delineate these unique perceptual (and behavioral) frameworks, we shall have q sets of different unique behavioral frameworks, where q is the dimensionality of B -space.

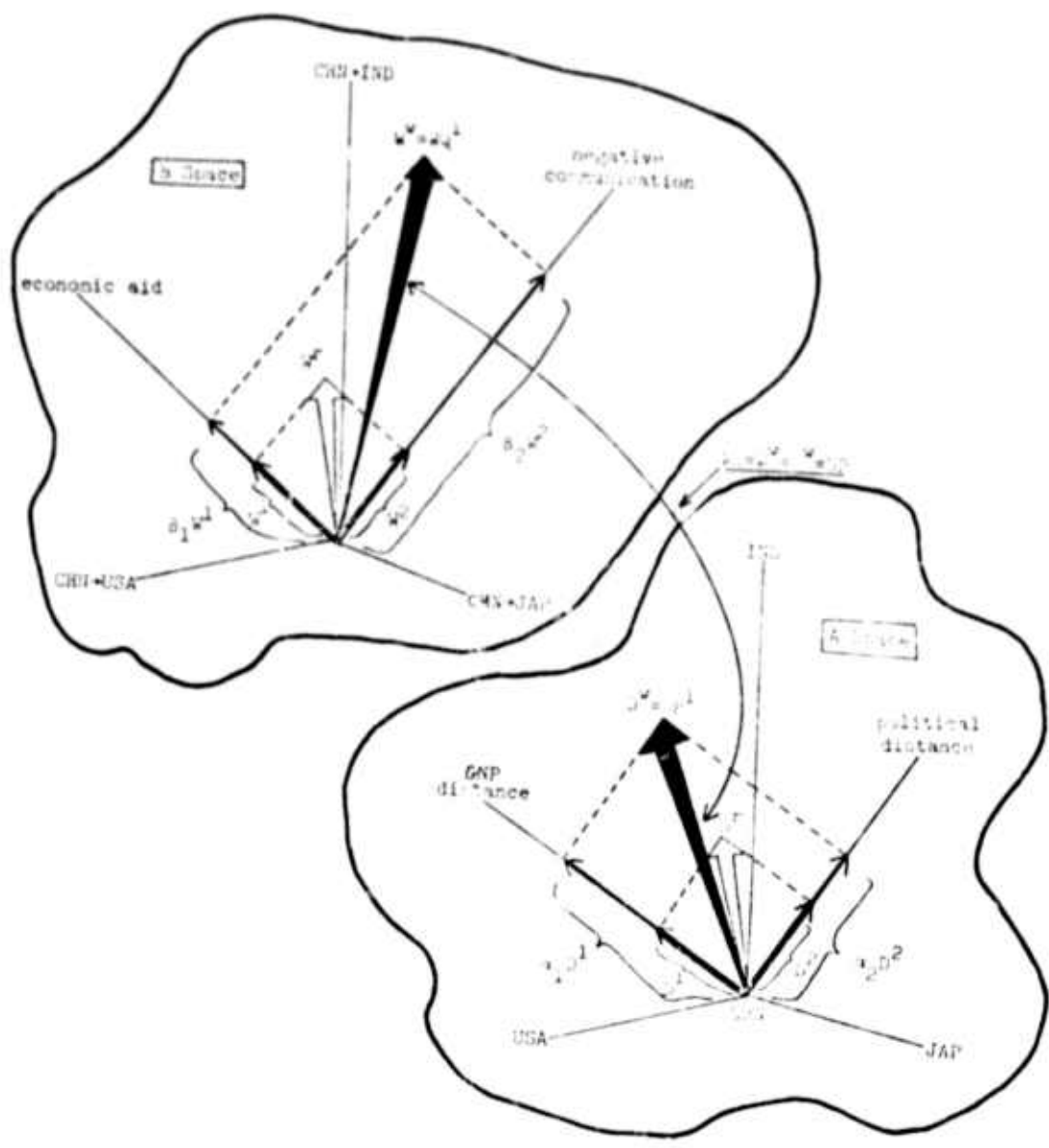


FIGURE 2
GEOMETRIC ILLUSTRATION OF CRM
(CANONICAL REGRESSION MODEL) OF FIELD THEORY

where W and D are known, and U is the random error uncorrelated with any of the variables in D .

A solution is possible if we put the following restrictions on the equation⁵⁰

$$\begin{aligned} Y'_h V_g &= \text{maximum correlation when } h = g \\ Y'_h V_g &= 0, \text{ when } h \neq g \\ Y'_h Y_h &= V'_h V_h = 1 \end{aligned} \tag{14}$$

The equation (12) with restrictions (14) is the canonical regression model⁵¹ and we can solve for the best fitting Y and V from W and D employing canonical analysis. Then " $V(=DP)$ will give the parameters of P best in the sense of minimizing U , and $Y(=WQ)$ will give the behavior dimensions of B having the best correlations with attribute differences D ."⁵²

The canonical analysis gives us q different canonical equations,⁵³ each of which maximizes the correlation between the paired canonical variates (Y_h and V_g) under the restriction that each pair is orthogonal to all other pairs. In other words, the first canonical equation gives the highest possible correlation between the first composite score (variate of distances (V_1)) and the first composite variate of behavior (Y_1). The next composite variate of distances (V_2) and behavior (Y_2) which maximizes

⁵⁰See Rummel, 1969b, p. 24.

⁵¹For the canonical regression model and its mathematical derivations, see Hotelling, 1935, Hooper, 1959, Cooley and Lohnes, 1962, Anderson, 1958, and Glahn, 1969.

⁵²Rummel, *op. cit.*, p. 24.

⁵³The number of pairs of canonical variates which come out from a canonical analysis is q or p , whichever is the smaller.

the correlations of the remainder of the total variances (the unexplained portion of the variances which is independent of those explained by the first canonical equations) after the first equation had explained as much as possible, and so on for the third to q-th equations.

Then how can we fit this model to reality? I interpreted the model in the following way: The whole decision space of the decision-makers, which includes both the inputs (targets of perception; here these are attribute distances between the decision-maker's nation and other nations) and outputs (decision result; behavior), may be decomposed into many subspaces or substructures of the decision process. For example, for military aid to other nations Chinese decision-makers would consider mainly economic distances and political systems rather than literacy rates, language difference, and Catholic population. In determining the behavior concerning student exchange, however, language difference, and technical distances may emerge as major considerations. Here we may say that the first pattern of relations is a political subset of the behavior structure while the latter constitutes a cultural subset.

Each substructure of the behavior pattern is represented by each of the canonical equations of the model. In this sense, equation (11) is one of the subsets of the whole model which contains q number of subsets. We then can express the general CRM in the following form,

$$W_{mxq} Q_{qxq} = D_{m \times p} P_{p \times q} + U_{mxq} \quad (15)$$

I called this new model the Canonical Regression Model (CRM) of field theory.⁵⁴

⁵⁴Technically speaking, the MRM is a special case of the CRM where all β coefficients except for one, the k-th parameter β_k are zeros. In other words, if we give another restriction $\beta_k = 0$ if $k \neq$ number of the equation (10) will degenerate into

As discussed above, the MRM has one decision framework and the CRM has two -- perceptual framework and behavioral system -- and this means that the decision framework in the MRM is decomposed into two separate systems in the CRM.

Both the MRM and the CRM have merits and disadvantages. To delineate China's unique foreign policy structure (behavior pattern), however, the CRM is better and thus will be used here.⁵⁵

3.4 Status-Field Theory: A Derivative

As we have seen, field theory has an explicit axiomatic and mathematical structure specifying the form of relationships between international behavior and attribute distances, but it does not indicate which specific behavior is a consequence of particular attribute distances.⁵⁶ Field theory therefore appears to be a mathematical skeleton, "barren of substantive meaning and implications."⁵⁷

The most recent attempt to derive a substantial theoretical statement that links a specific behavior to specific sets of attribute

$$w_{i \rightarrow j, k} = \sum_{\ell=1}^p \alpha_{\ell} d_{k \rightarrow j, \ell}$$

which is the multiple regression model. This is only true when W and D are orthogonal matrices. If we use factor scores (obtained from the orthogonal varimax rotation) instead of raw data, W and D are orthogonal.

⁵⁵To prove this, a lengthy mathematical discussion is required, and the proof is omitted here but appears in Rhee, 1971, Chapter IV.

⁵⁶Although empirical tests have determined many specific relations, the theory itself does not propose these relationships. For some empirical findings, see Rummel, 1969, 1971, 1972 and Rhee, 1971.

⁵⁷Rummel, 1971, p. 2.

distances within a field theoretical framework is the development of status-field theory.⁵⁸ In status-field theory Rummel incorporated the basic theoretical statements of status theory⁵⁹ into the analytic framework of field theory.

In Rummel's status-field theory, status is defined as the following:

Generally, all social systems are conceived as stratification systems based on the division of labor and differential social characteristics. Stratification is an ordering of individuals or nations on some esteemed, desirable characteristics and an individual's position in this ordering is his status. Contemporary sociologists consider the major status characteristics of societies as wealth (or privilege), power, and prestige; a person's wealth, power, and prestige comprise his statuses and his combined wealth, power, and prestige measure his local status -- his rank -- in society (Rummel, 1971, p. 7).

Status is an analytic construct designed to measure an individual or a nation's relative location on a specified dimension. Two criteria are basic to the meaning of the status: ordinal differentiation and the desirability of upward change on the scale.

A concept by definition differentiates one group from others based on one or more meanings or criteria. One meaning of the construct status lies in its ordinal discrimination of objects. There are many concepts (or variables) that classify entities into ordered classes by definition (e.g., size of nation, height of man). Status is distinguished from these intrinsic ordinal variables by its second meaning; desirability of upward change. The object to be classified should desire upward change along the given scale (it is the desire of the object, not the desire of

⁵⁸For a complete discussion of status-field theory, see Rummel, 1971.

⁵⁹Status theory referred to here is not a particular theory. Rather, it is a set of basic themes which Rummel extracted and reorganized from various sociological and international relations literature. For further discussion, see Rummel, 1971, pp. 6-8.

the observer). In this sense, status inevitably includes value judgements of the objects to be classified. This means that the construct status is a psychological variable. In other words, with status we deal with human motivation directly.

One basic difference between human behavior and the mechanical movements of unconscious material entities is that human beings choose their behavior according to their judgement, while the others do not. Although human deliberation is bounded by the field force exerted on its location point in the field at the time, it has a significant range of alternative choices that would result in different behavior. More simply, human decisions link the field force to the final human behavior. As a result, without coping with human deliberation, we cannot make a complete explanation of human behavior (both individual and group behavior).

The construct status simply depicts a universal human psychological tendency, and this tendency is oriented in re specific attribute differences. Thus, status per se is a model of human behavior.

With the status concept, then, we can generalize the pattern of human reaction to a given field force, and shall be able to explain and predict human behavior under a given condition.⁶⁰

Status theory postulates a basic behavioral force generated from differences in nations' statuses. Here all social systems are conceived as "stratification systems based on the division of labor and differential social characteristics" (Axiom 3). Stratification is an ordering of

⁶⁰Wright has a similar argument: "The behavior of human beings is conditional on their environmental situation, and discovering the forms of relations between specific patterns of environmental conditions and patterns of the actor's behavior is essential in order to explain and predict the behavior" (Wright, 1955, p. 499).

individuals or nations on some esteemed, desirable characteristic and an individual's position in this ordering is his status. Wealth, power, and prestige are three major status dimensions and a nation's combined wealth, power, and prestige measure the nation's total status (rank) in the international system.

Two basic behavioral propositions have been posited: the first is that high status nations interact more with others than do low status nations, and low status nations direct behavior upward in the status hierarchy; the second proposition is that status disequilibrated nations -- those high on some statuses and low on others -- will be frustrated and under stress, potentially leading to internal or external conflict.

To incorporate these status theory statements into the field theoretic analytic scheme, Rummel added six new axioms to the three original field theory axioms.⁶¹ As a result, status-field theory has the following nine axioms (F, original field theory axioms; S, additional axioms).

- Axiom 1: International relations is a field consisting of all nations, their attributes and interactions, and their complex interrelationships through time. (F)
- Axiom 2: The international field is a Euclidean attribute space defining all the attributes of nations and a Euclidean behavior space defining all nation dyadic interactions. (F)
- Axiom 3: International relations is a stratified social system. (S)
- Corollary 1: Status is a continuous variable.
- Corollary 2: An attribute space position defines a nation's relative status.
- Corollary 3: A nation's elite identify with their rank and status configuration.

⁶¹A discussion of the theoretical arguments on these axioms is omitted here. See Rummel, 1971.

Corollary 4: Status incongruence between nations i and j is the distance vector between their status vectors on a status dimension.

Axiom 4: Between nation attribute distances at a particular time are social forces determining dyadic behavior at that time. (F)

Axiom 5: Some behavior dimensions are linearly dependent on status. (S)

Axiom 6: Status behavior is directed toward higher ranking nations and the greater a nation's rank the more its status behavior. (S)

Axiom 7: High rank nations support the current international order. (S)

Axiom 8: Nations emphasize their dominant status and the other's subordinated statuses in interaction. (S)

Corollary 5: Status disequilibrium causes cognitive dissonance.

Corollary 6: Common statuses between nations provide them with similar interests and a communication bridge.

Corollary 7: The more two nations are status incongruent, the more their relationships are uncertain and the more incongruent their expectations of each other's behavior.

Axiom 9: The more similar in economic development status, the more nations are mutually cooperative. (S)

Based on these axioms, Rummel deduced thirteen theorems to explain status dependent cooperation and conflict between nations.⁶² Among them the following six are directly related to the cooperation, conflict and interaction behaviors and thus, will be discussed further in the following section: Theorem 6, Cooperation Theorem; Theorem 7, Conflict Theorem; Theorem 8, Economically Developed Conflict Theorem; Theorem 9, Economically Underdeveloped Conflict Theorem; Theorem 10, Economically Developed Status Behavior Theorem; Theorem 11, Economically

⁶²All thirteen axioms are given in Appendix I. For the derivation of these theorems from the axioms, see Rummel, 1971.

Underdeveloped Status Behavior Theorem. (For the contents, see Appendix I.)

IV. CHINA'S EXPECTED BEHAVIOR: EMPIRICAL IMPLICATIONS OF FIELD THEORY AND STATUS-FIELD THEORY

So far we have flown high in the sky with the abstract theoretical aspects of field theory and status-field theory. Now, let us come down to reality on earth. As stated in Section II, our theorizing effort has only one purpose: to have a better understanding of the reality we encounter in the world. Thus, a theory should be evaluated for its applicability to reality. For instance, in international relations, a theory should explain a nation's behavior, and predict its future behavior. What, then, can field theory and status-field theory say about China's foreign behavior? In this section, empirical implications of field theory and status-field theory for China's foreign behavior will be discussed.

4.1 Pattern Relations Between China's Behavior and Her Attribute Distances from Other Nations

In Section III, we have already stressed that field theory per se does not provide us with any substantial empirical statements on the relations between a nation's behavior and her attribute distance from other nations. The theory only tells us that behavior patterns are linearly related to attribute distances.

To recapitulate, the model of field theory

$$W_{mxq} O_{qxq} = D_{mxp} P_{pxq} + U_{mxq} \quad (15)$$

gives us q number of canonical regression equations, each of which represents the patterned relations between a given set of behavior and attribute distances.

The weighting parameters O (for W, dyadic behavior) and P (for D, attribute distances) represent a nation's "behavioral preference system" and "perception framework" respectively. Because O and P are formulated by the actor's history, traditions, prevailing value system, ideology, etc., we can assume that they will not change significantly in one or two decades.

Thus, once O and P are determined for any given actor nation, then we can have models which show the empirical substantive pattern relationships between behavior and the attribute distance. Suppose we have the following pattern model for China:

$$.88 \text{ negative communication} + .46 \text{ trade} = .97 \text{ power distance} \quad (r = .99).^{63}$$

This equation shows that approximately seventy-seven percent⁶⁴ of the variance in China's negative communication behavior and eleven percent in trade activities are explained mainly by one attribute distance -- power disparity. The model tells us that the amount of joint behavior of China's negative communication and trade directed to an object nation (this constitutes a behavioral pattern) is a function of their power distance. This means that the more powerful the object nation, the more hostile is China's communication, with more trade between the two nations. For instance, the Soviet Union is far more powerful than China and thus is expected to receive hostile communication from and to trade heavily with China.

⁶³This equation is one of the actual findings for China with 1955 data. See Rhee, 1971, p. 140.

⁶⁴The figures in the illustrated model are product-moment correlations and if we square them and multiply them by 100, we can find what percentage of the variance in the corresponding variables are depicted by the given pattern equation.

The parameters (Q and P) in the model are left to be determined empirically; we cannot deduce them from the theory itself. In this study, the parameters will be estimated with the actual data of China's behavior for 16 years (1950 - 1965) toward all sovereign nations and the actual attributes of all those nations (see the following section for data).

4.2 China's Expected Cooperation, Conflict and Interaction Behavior: Hypotheses Generated From Status-Field Theory

As we briefly discussed in 3.4, the major themes of status-field theory are:

1) the higher the joint rank of the actor and the object nation, the more cooperative their behavior (Theorem 6);

2) for economically developed actors, status-dependent conflict behavior is negatively correlated with economic development distance and positively correlated with power distance, while for economically underdeveloped actors, the correlations have opposite signs (+ for economic development distance; - for power distance (Theorems 7, 8, 9)).

3) for economically developed actors, the status-dependent interaction (cooperation and conflict combined) is negatively correlated with (and only with) power incongruence, while for the economically underdeveloped actors, the interaction is negatively correlated with (and only with) economic development incongruence (Theorems 10, 11).

To understand the empirical implications of these theorems, first of all let us clarify the meanings of the concepts involved.

Cooperation: This is an analytic construct. It is not a variable in the ordinary sense. Cooperation is a behavior-space cluster of highly intercorrelated cooperation vectors (cf. Theorem 6). The content of the term is not specified by the theory; it is determined by the actual

operationalization process. In this study, the construct "cooperation" will be the basic behavioral factors on which most of the cooperation variables are highly loaded.

This means that there may be more than two separate clusters of cooperation variables which can be named cooperation behavior. In other words, there can be different kinds of cooperation factors. Furthermore, among these, some cooperation factors are status-dependent, while the others are not. In status-field theory, only status-dependent cooperation behaviors are to be explained by status incongruence. Therefore, we can say that status-field theory is applicable only to a subspace of the total behavior space which comprises only status-dependent behaviors.

Then, what are cooperation variables? Cooperation is any associative dyadic behavior. It includes "such private international behavior as tourists, student movements, migration, mail, exports, telegrams, and telephone calls; and such public international relations as treaties, economic and military aid, state visits, international conferences, international organization memberships, extensions of diplomatic recognition, and exchange of ambassadors" (Rummel, 1971, p. 55).

Conflict: The construct conflict is a behavior-space cluster of highly intercorrelated conflict vectors. This will be identified with a behavioral space factor on which most of the conflict variables are highly loaded. As there may be more than two cooperation factors in behavior-space, there may also be more than two different kinds of conflict factors, each of which represents clusters of similar conflict variables. Again, among these conflict factors, some of them are status dependent, while the others are independent.

Interaction: This is a neutral concept which depicts all kinds of transactions between two nations. Thus, interaction includes both conflict and cooperation behavior. In Rummel's view, cooperative and conflictful behavior are not necessarily separate behavioral dimensions by themselves, but may be fused into one interaction dimension, although cooperation and conflict form distinct clusters of behavior.⁶⁵ Empirically, the two kinds of behaviors form separate orthogonal factors.⁶⁶ However, they have similar projections onto one behavior dimension. Accordingly, this dimension equals the vector sum of cooperation plus conflict, each weighted about equal. In status-field theory, the concept status behavior (Theorems 10, 11) is defined as the vector sum of status-dependent cooperation and status-dependent conflict.

Now, with these concepts in mind, let us reexamine the six relevant theorems of status-field theory and try to deduce hypotheses on China's cooperation, conflict and interaction behaviors.

Cooperation Theorem

The cooperation theorem says "the higher the joint rank of nations i and j , the more cooperative their behavior." That is,

$$CO_{i+j} = \alpha_{11} d_{i-j,1} + \alpha_{12} d_{i-j,2} \quad (16)$$

where CO_{i+j} is a behavior space cluster of highly intercorrelated cooperation vectors.⁶⁷ The cooperation theorem is derived from a combination of the

⁶⁵See Rummel, 1971, p. 79.

⁶⁶See Rhee, 1971, pp. 113-4.

⁶⁷In Rummel's original version, the signs in the equation are reversed. Rummel defines $d_{i-j} = S_i - S_j$ where S_i and S_j are statuses of i and j respectively. But I redefined $d_{i-j} = S_j - S_i$ to retain consistence with my previous works. This sign reversion also applies to both the conflict and the interaction theorems.

Status-Quo Axiom (Axiom 7) which says "high rank nations support the current international order" and the Rank Behavior Axiom (Axiom 6) which says "status behavior is directed toward higher ranking nations and the greater a nation's rank, the more its status behavior." But Axiom 5 is also necessary to get the linear equation of the theorem.

From the definition of status, we see that every nation desires an upward change in her status, and once achieving it, wants to maintain it. If the existing international system provides a nation with a high status, then it is natural for that nation to attempt to maintain the system through cooperative behavior.

Thus, status-dependent cooperation behavior should be directed toward higher ranking nations and the greater the object's rank, the more intense the cooperation, according to the Rank Behavior Axiom. And the degree of cooperation is linearly related to the status difference according to the Status-Dependence Axiom (Axiom 5). Thus we have the cooperation theorem, $CO_{i \rightarrow j} = \alpha_{11} d_{i-j,1} + \alpha_{12} d_{i-j,2}$, where subscripts 1 and 2 denote the two status dimensions, economic development and power, respectively; d , the distance from i to j on the status dimensions; and α , positive parameters. If we apply this theorem to China's cooperation behavior, we have the following hypothesis:

Cooperation Hypothesis: the more economically developed and the more powerful the object nation, the more China's status-dependent cooperation behavior is.

Conflict Behavior

The derivation of the status-dependent conflict behavior theorems of status-field theory (Theorems 7, 8, 9) is very complicated; various status related theories are combined into a long logical chain which fits into the field theoretical frame. A brief sketch is given below.

In status theory, international relations is viewed as a stratified social system (Axiom 3), and economic development and power are the two status dimensions (Definition 2). The distances between nations on these two status dimensions define their relative statuses (Corollary 2), and the difference between the two status difference vectors ($d_{i-j,1} - d_{i-j,2}$) is the status incongruence between the two nations i and j (Corollary 4).

The two status dimensions are linearly independent and thus a nation's relative status on one dimension may differ from that on another dimension. The difference between the two relative statuses is defined as a nation's status disequilibrium (Definition 5).

Since all nations emphasize their dominant status and the subordinate statuses of others in their interactions (Axiom 8), status disequilibrium produces cognitive dissonance (Corollary 5). For instance, if nation i , with a high status on power and a low status on economic development, interacts with nation j , i will emphasize its high status on power, but j will emphasize i 's status on economic development.

According to Rummel, cognitive dissonance motivates an actor nation to balance its behavior and status while still preserving its high status, i.e., by altering either the lower status upward or shifting the object's emphasis to the higher one. But both are practically impossible, because status cannot be increased easily nor can the actor control the object nation. As a result, the actor's positive behavior toward the object tends to turn into negative behavior to compensate for the object's high status. Thus, the status-disequilibrated nation is going to conflict with objects which have higher statuses, and the more disequilibrated (the greater the incongruence) the more conflict. Then, we can have the following relation

$$CF = |a_1d_1 - a_2d_2| \quad (17)$$

where d_1 is economic development distance (status distance) and d_2 , power distance. The difference between d_1 and d_2 , then, is the status incongruence between nations i and j .

Since there are two status dimensions -- power and economic development, there are two different kinds of status incongruence; actor i is higher than j on power, lower on economic development ($d_1 < d_2$), and vice versa ($d_1 > d_2$). The functions of these two incongruences differ, however, due to the different implications of the two statuses.

First, power status is ascribed. It is almost impossible to change rapidly. Land area, population, and natural resource are virtually unchangeable. The economic development status, however, is achieved, and compared with power, is much easier to improve. Second, power is meaningful only in a relative sense. If a nation is more powerful than others, that is sufficient. On the other hand, economic development is meaningful both in an absolute and in a relative sense. There is no limitation on human desire to enjoy wealth. These different functions of the two statuses produce different behavioral patterns.

Interaction in general leads to various issues between the interacting nations. Conflict, as a situation, results from disagreement over how issues should be resolved. Disagreement between two nations of different statuses comes from the fact that the dominant one wants to maintain the status-quo which provides her with the advantageous edge (Axiom 7), while the less dominant one attempts to reach that status.

On the economic development dimension, a lower status nation's desire to achieve higher development is limited to enhancing her status for status differences are not necessarily reduced by undercutting the

forerunner's development. The economic development status is achieved, and thus a positive status distance (i.e., the actor's status is lower) alone does not necessarily lead to conflict. Instead, the object's high economic development provides good grounds for cooperation, for a developed nation can offer the necessary know-how. On the power dimension, however, the situation is different. High power status is not easily obtained, and furthermore, absolute high status on power status is not so meaningful as absolute high status on the economic development dimension. Desire for power comes from the hope to have advantageous edge vis-à-vis others to settle disputes in his own terms. Thus, if one has power strong enough to subdue its counterpart, it is sufficient; it is meaningless to have ten or a hundred times more power than necessary. And what matters is only the positive edge vis-à-vis the counterpart; absolute strength does not matter. Therefore, reduction of status difference on the power dimension is achievable either by weakening the dominant nation's power or by enhancing its own power. Thus, positive status distance on power dimension (i.e., the actor's lower status) usually leads to conflict.

In general, therefore, we can say that when the achieved status (economic development) is higher than the ascribed status (power) -- when $S_{11} > S_{12}$ -- intra-punitive behavior happens. On the contrary, when the ascribed is higher than the achieved -- when $S_{11} < S_{12}$ -- external aggressive behavior results (Rummel, 1971, p. 70). In other words, when the actor is low on economic development while high on power and the object nation is in the opposite situation, we can expect the highest conflict. In terms of distance, then, the above argument can be expressed as follows: the status-dependent conflict is negatively related to d_1 and positively related to d_2 . As a result, equation (17) can be rewritten

$$CF_{i \rightarrow j} = -\alpha_1^* d_{i-j,1} + \alpha_2^* d_{i-j,2} \quad (18)$$

where $CF_{i \rightarrow j}$ is nation i 's status-dependent conflict behavior toward nation j ; α^* is a positive parameter; and $d_{i-j,1}$ and $d_{i-j,2}$ are the status distances from nation i (in our case, China) to j on the economic development and the power dimensions, respectively.⁶⁸

If we apply this theorem to China's conflict behavior, we will have the following hypothesis.

Conflict Hypothesis: the more powerful and the less economically developed the object nation, the more conflictful is China's behavior.

Interaction Theorem

Now let us move to the interaction theorem. Rummel defines interaction behavior as the linear sum of cooperation and conflict. Thus, the model for status-dependent interaction is

$$\begin{aligned} CO &= \alpha_1 d_1 + \alpha_2 d_2 \\ +) CF &= -\alpha_1^* d_1 + \alpha_2^* d_2 \\ \hline CO + CF &= (\alpha_1 - \alpha_1^*) d_1 + (\alpha_2 + \alpha_2^*) d_2. \end{aligned}$$

If we denote $(\alpha_1 - \alpha_1^*)$ as γ_1 and $(\alpha_2 + \alpha_2^*)$ as γ_2 , then the equation will be

$$CO + CF = \gamma_1 d_1 + \gamma_2 d_2. \quad (19)$$

⁶⁸Rummel's original version of status-field theory included two separate conflict theorems for economically developed actors and economically underdeveloped actors (Theorems 8 and 9; see Appendix). The new theorem discussed above is the same as Rummel's Theorem 8. The separation is based on the Economic Development Status Axiom (Axiom 9). But I found that this axiom contradicts other parts of the theory and therefore discarded the axiom.

If we assume that d_1 and d_2 are orthogonal (empirical findings assert that they are almost orthogonal) and we measure CO, CF, d_1 and d_2 in standard scores (in status-field theory, they are measured in this way), then both α 's and α^* 's are the product-moment correlations of CO and CF with the status distances, and will vary between 0 and 1.0 because α 's and α^* 's are all positive parameters. Thus $(\alpha_1 - \alpha_1^*)$ should be near zero while $(\alpha_2 + \alpha_2^*)$ is near unity.

For practical purposes, therefore, the equation (19) may be written

$$CO + CF = \gamma_2 d_2. \quad (20)$$

This means that almost all the (CO + CF) variance must be explained by d_2 . This is the interaction theorem (Theorem 11) which says that "the status-dependent interaction (cooperation and conflict) behavior is a function of their power status difference."

China's interaction behavior can be predicted from this theorem as follows:

Interaction Hypothesis: The more another nation has power vis-à-vis China, the more cooperative plus conflict behavior China will direct towards her.

V. VARIABLES AND DATA

5.1 The Population

In this study, Communist China's behavior for the first sixteen years (1950 - 1965) after her independence was analyzed. Due to limits in time and funds, five time points were selected: 1950, 1955, 1960, 1963, and 1965.

The objects of China's behavior include all sovereign nations whose populations exceed 500,000. The numbers of nations for each time point

are: 71 (1950), 81 (1955), 86 (1960), 106 (1963), and 112 (1965). Thus, the total number of dyads is 456. In the data matrix, the same dyads (e.g., China-USA) for different years were treated as independent cases. Thus, China-USA for 1950 (CHN-USA50) and China-USA for 1955 (CPN-USA55) are independent.

In A-space, however, the number of cases included in the raw data matrix is 461, because the actor, China, was also included. The names and abbreviation codes are given in Appendix II.

5.2 Variables

A total of sixty-nine variables were used for defining attribute space. Sixty-four of these were taken from the Dimensionality of Nations (DON) Project study on attributes of nations.⁶⁹ Four of the remaining five were included specifically to measure the nations' attributes in relation to China. These are Chinese population/total population (CHINP), diplomatic relations with Republic of China (DIPTA), UN voting on China Issue (UNVOT), and geographical distance from Peking (DISTP). Finally, the last two digits of the calendar year were included as a variable to see the effect of time on the changes in the attributes. The variable names and abbreviation codes are presented in Table 1.

For B-space (China's dyadic foreign behavior space), seventeen variables were selected carefully to represent both the cooperative and the conflict variables.⁷⁰ The variables are (abbreviation codes are given in parentheses):

⁶⁹The variable names, definitions, sources as well as data are contained in a research report published by the DON Project (Research Report No. 64), December 1972.

⁷⁰When this study was designed, seven more conflict variables were included. Later, however, it was found that there was little variance on those variables. For example, for the variable, war, there were only ten cases.

TABLE 1

LIST OF ATTRIBUTE VARIABLES

No.	Abbr. Code	Name	No.	Abbr. Code	Name
1	TEL-PC	telephones/population	28	ZD-WTR	dwellings with running water/dwellings
2	ZA-POP	agricultural population /population	29	FST/ST	foreign college students/ college students
3	ENC-PC	energy consumption/ population	30	NEUTRL	membership in Neutral bloc
4	ILLITE	illiterates/population	31	NATAGE	age of country
		10 years of age or older	32	ZUNEMP	unemployed/economically active population
5	GNP-PC	GNP/population	33	LANGRP	languages
6	ENXP	population x energy production	34	LGRP/P	membership of largest language group/population
7	NI	national income	35	ETHGRP	ethnic groups
8	POPULA	population	36	AIDRVD	economic aid received
9	DEFEXP	defense expenditure	37	D-TR	technical assistance received
10	BLOC	bloc membership	38	GE-GVT	government education expenditures/government expenditures
11	US/AID	US aid received/USSR and US aid received	39	CAL-PC	calories consumed minus calories required/calories required
12	TOTALI	freedom of opposition	40	PR/CAL	proteins/calories
13	D-KILL	killed in domestic violence	41	R/TRSL	Russian titles translated/ foreign titles translated
14	STRIKE	general strikes	42	MIL/PP	military personnel/ population
15	RIOTS	riots	43	PARTYS	political parties
16	PURGES	purges	44	COM/PP	communist party membership /population
17	DEMONS	demonstrations	45	GVT-PC	government expenditure/GNP
18	ZCATH	Roman Catholics/population	46	MONARC	monarchy or not
19	US-DIS	air distance from U.S.	47	PUP-PT	pupils in primary school/ primary school teachers
20	DENSITY	population/national land area	48	LAWTRA	legality of government change
21	ZARABL	arable land/total land area	49	LEGIT	legitimacy of present government
22	AREA	national area	50	EGRP/P	largest ethnic group membership/population
23	RDS-KM	road length/national area	51	ASSASS	assassinations
24	RR-KM	railroad length/ national area	52	EVTCS	major government crises
25	RELGRP	religions			
26	RAIN	average rainfall			
27	RGRP/P	membership of largest religion/population			

TABLE 1 (continued)

No.	Abbr. Code	Name	No.	Abbr. Code	Name
53	INVEAL	balance of investments	62	CEOG-X	geography-X
54	STYLF	system style	63	CEOG-Y	geography-Y
55	CONSTI	constitutional status	64	CEOG-Z	geography-Z
56	ELECTO	electoral system	65	TIME	calendar time (year)
57	COMCUN	non-communist regime	66	DISTP	geographical distance from Peking
58	LEADER	political leadership	67	UNVOT	UN voting on China issue
59	MILPAR	military participation	68	DIPTA	diplomatic relations with Republic of China
60	BUREAU	bureaucracy	69	CHINP	Chinese population/ total population
61	CENSOR	censership score			

1. Economic Aid (ECAID): the amount of economic aid that China has given to B during the year. Data include amounts expended in grants or long term loans in cash and in kind, including within the latter category the provision of services as well as commodities. Main source: Eckstein, 1966.
2. Diplomatic Relations (DIPLO): diplomatic relations between China and the object nations are measured according to the following code: 0 = no relation, 1 = agreement to establish diplomatic relations only, 2 = only one side established legation (embassy or consular office), 3 = both sides established legations. Source: Jen-min Shou-tse, etc.
3. Official Visits (OFVIS): visits by Chinese officials representing the Chinese government to the object nation. Officials include only the following: the President of the People's Republic of China (PRC), Prime Minister, Deputy-prime Ministers, Minister of Foreign Affairs, Minister of Defense, Chairman of the Central Committee of the China Communist Party (CCP), and the Chairman of the Standing Committee of the People's Congress of the PRC.
4. Positive Communication (POCOM): directed positive communication by the policy makers who are defined to include the Chairman of the Central Committee of the CCP, the President of the PRC, the Chairman of the Standing Committee of the People's Congress of the PRC, the Prime Minister, the Ministers of Foreign Affairs and Defense, the Central Committee of the CCP, the presidium of the PRC, the Standing Committee of the People's Congress, and the Cabinet of the PRC. Positive communication includes friendly comments, formal suggestions of support, concrete offers of support and decisions of supportive action. Units are the frequency of articles that appeared in Jen-min Jih-pao during the year.
5. Treaties of Friendship and Foreign Policy Alignment (TRFFP): includes only bilateral treaties. Following the Chinese practice, a joint communique signed by the governments' official representatives is regarded as a treaty. Source: Jen-min Shou-tse, Johnston & Chiu, 1968.
6. Treaties of Economic Assistance (TRAID): same as Variable No. 5.
7. Total number of Bilateral Treaties (TRTOL): same as Variable No. 5.
8. Negative Communication (NECOM): similarly defined as Variable No. 4. Negative communication includes critical comments, accusations, agitations or the equivalent, demands of corrective actions, warnings, threats, and decisions of hostile action.
9. Verbal Support to Anti-government Elements in the Object Nation (VSANT): anti-government elements are defined as any individual or group who opposes incumbent government. Code: 0 = no, 1 = yes.
10. Support to Rebels (REBEL): rebel is defined as an organization which is outlawed by the government and is engaged in military resistance to topple the government. Code: 1 = mentioned in the government or party

paper, 2 = endorsement of support by the policy makers, 3 = accepted delegation from rebels or gave official recognition, 4 = material support.

11. Exports (EXPOR): total value of exports during the year, measured in 10^4 \$. Source: Eckstein, 1966, etc.

12. Degree of Concern (CONCN): measured in terms of the total number of articles in the Jen-min Jih-pao which reports about the object nation without regard to the subject matter.

13. Treaties of Mutual Economic Cooperation (TRECO): same as Variable No. 5. Economic cooperation includes trade, science and technological cooperation, finance, and customs.

14. Treaties of Cultural Cooperation (TRCUL): same as Variable No. 5.

15. Treaties of Postal Services and Transportation (TRPOS): same as Variable No. 5.

16. Non-political Visits (NPVIS): all non-political visits by a Chinese citizen disregarding the rank of the person. This represents the number of events, not the number of persons. Source: Jen-min Jih-pao.

17. Time (TIME): last two digits of calendar year for which the data were collected.

5.3 Missing Data Estimation

In general, there are four approaches to solving the problem of missing data in cross-national data: 1) the order of the data matrix can be reduced until only the complete data remain, 2) missing data may be treated as blanks in the analysis, 3) some of the missing data may be estimated by ratings, mean values, measurement scale reduction, factor analysis, or regression analysis.

In this study, I applied both methods 3) and 4), first estimating the missing data subjectively as far as I deemed it adequate, then using the MISDAT program developed by Wall and Rummel for the remainder.⁷¹

⁷¹See Wall and Rummel, 1969, pp. 1-2. This is a kind of regression estimate. The recent version of the computer program for MISDAT, called the Dynamic Missing Data Estimation Program (the algorithm remains unchanged) is available from the DON Project.

Thus, the available data for each variable were regressed on the available data for the other variables to determine the regression estimates for the missing data. Then, with the estimated data included, the computations were repeated again and again until the estimates converged to stable values for the missing data. This process was applied to all variables with missing data.

VI. CHINA'S ACTUAL BEHAVIOR

In the previous section, we have discussed China's expected behavior from the perspectives of field theory and status-field theory. Now, let us examine the actual Chinese behavior during the sixteen-year period so that we can compare the two later.

In this section, in 6.1, we will examine the results of the factor analysis of the behavior data matrix. Then, in 6.2 we will see the cross-time shift in behavior patterns for some selected dyads.

6.1 Behavioral Clusters: Results of the Factor Analysis

In field theory, the concepts used in the model are to be operationalized through factor analysis of the total behavior space.⁷² In international relations, when we test an analytic model, one of the most serious problems is to operationalize in a meaningful way the concepts in the model in terms of real world variables. The conceptual variables of the model are actually analytic constructs which are defined to meet the conditions given in the theoretical framework. The purpose of theorization, however, is to explain real world phenomena. Thus, the constructs of the model must be connected to real world concepts. The ideal of operationalization is of course to

⁷²See 3.2 of this paper. See also Rhee, 1971, pp. 97-98.

maximize the degree of measurement isomorphism between the analytical constructs and the corresponding operational concepts, i.e., to select indices which presumably represent their theoretical counterparts in the real world. At this point we should understand that the selected indices are only one of many that could be used.⁷³

Theoretically, Rummel's field theory is meant to cover all variability in a nation's behavior. Thus, any index that can tap the behavioral variations of nations should be included. Practically, however, this is impossible because of the infinite variety of indices. The theory assumes axiomatically that both the behavior and the attribute spaces have a finite number of dimensions and that all concepts (indices) are linearly derivable from them. This means that once the basis dimensions are known, we can represent all the (linear) variability in behavior (as well as in attributes) with a set of dimensional vectors, no matter how many original variables.⁷⁴

In this study, to define the basis dimensions of China's behavior space, 1950-1965, the seventeen selected indices were factor analyzed. The principal component technique and the component factor model were used. To get the simplest factor structure (the clearest clustering of the variables), they were rotated orthogonally using the varimax criteria.⁷⁵

⁷³The distinction between the operational indices and the conceptual variables of the analytic framework is discussed in East and Gregg, 1967, pp. 248-9.

⁷⁴Empirically, we cannot find the exact dimensions of the behavior or the attribute space; we can only have an approximated basis of the space. In this study, unless specified otherwise, this approximated basis will be referred to.

⁷⁵An oblique rotation was avoided, because the resulting bases were to be used in canonical analysis, and if the factors are mutually inter-correlated, we cannot distinguish the contribution of the individual factors from the interaction effects among them.

The resulting factors, then, are the indices of China's behavior and the factor scores are the values for each of China's dyadic behavior.

As a result of factor analysis (P-factor analysis), nine factors were extracted. The factors are presented in Table 2. Let us have a closer look at each of the factors.

Cooperation I (COI): PENETRATION Highly loaded variables on this factor are economic aid (.86), treaties of aid (.80) and official political visits (.61). All of these variables are related in one way or another to Chinese government policy to penetrate.⁷⁶ The behavior represented by this factor are government-to-government relations where the Chinese government tries to procure the object government's favor and thus grasp some control of it.

Cooperation II (COII): FORMAL DIPLOMACY This factor is highly loaded by diplomatic relations (.79), treaties of cultural cooperation⁷⁷ (.73), non-political visits (.55), total number of bilateral treaties (.50), and official political visits (.46) in descending order in terms of the magnitude of loadings. The factor, thus, was labeled 'formal diplomacy.'

Cooperation III (COIII): SUBSTANTIAL COOPERATION This is another type of cooperation pattern, independent from the two above. On this factor, exports (.88), positive communication (.67), non-political visits (.55),

⁷⁶Rosenau defined a penetrated political system as "[a political system] in which nonmembers of a national society participate directly and authoritatively, through actions taken jointly with the society's members, in either the allocation of its values or the mobilization of support on behalf of its goals" (Rosenau, "Pre-theories and Theories of Foreign Policy" in Farrell, 1966, p. 65).

⁷⁷In China, the government controls all cultural exchanges with other countries as a diplomatic apparatus to strengthen existing good relations or to explore new benign relations. Thus, the number of treaties of cultural cooperation cannot be interpreted as strong cultural ties.

TABLE 2

P FACTOR LOADINGS OF 17 BEHAVIOR VARIABLES
ON NINE BASIS DIMENSIONS*

VARIABLES	COMMUNALITY	Rotated Factors								
		I CO1	II CO2	III CO3	IV** CF1	V** CF2	VI CO4	VII CO5	VIII CO6	IX TIME
1 ECAID	78	86								
2 DIPLO	79		79							
3 OFVIS	80	61	46				36	34		
4 FOCOM	79			67			33			
5 TRFFP	91						91			
6 TRRID	72	80								
7 TRTOL	89	40	50	39				48		
8 NGCOM	94									
9 VSANT	79					97				
10 RGEEL	85				83					
11 EXFOR	81			88	91					
12 CONCN	88			50		68				
13 TRECO	88							82		
14 TRCUL	83		73	32						
15 TRPOS	98								94	
16 NPVIS	74		55	55						
17 TIME	99									99
% of Total *** Variance		13.2	12.9	12.8	9.3	8.6	7.7	7.4	6.6	6.0

*Only loadings exceeding absolute value of .30 are given in the table. Decimal points are dropped. Factors are given in the order of the size of eigenvalues.

**For these vectors, original outputs have reverse signs.

***The portion of variance tapped by the rotated 9 factors is 84.5%. The % given in the table for each factor is the % of the total variance and not of the variance explained by the nine factors given.

and degree of concern (.50) loaded highly. Also moderately loaded were total number of treaties (.39) and treaties of cultural cooperation (.32). Countries usually export out of necessity. Though political relations between trading partners affect patterns of trade to a great extent, in general the paramount necessity of economic survival leads to a nation's trading. To protect the vital channel of trade, frequently some amicable political gestures (or at least restraint of political attack) follow. For example, China, suffering from the Soviet Union's cutoff of technical aid in 1960, could not launch serious political attacks against other suppliers of technological know-how such as Japan, West Germany, or Great Britain. The relatively high loadings of positive communication, non-political visits and degree of concern on this factor along with exports can be understood in this vein of logic. This cluster, thus, can also be called pragmatic cooperation or business interaction.

Cooperation IV (COIV): ALLIANCE This is the fourth cluster of cooperative variables. On this factor the only highly loaded variable is treaties of friendship and foreign alignment (.91). Among the other variables only official visits (.36) and positive communication (.33) loaded moderately on it. The behavior depicted by this factor is the strong Chinese commitment to the object's government. Along with formal diplomatic relations, this behavioral pattern shows Chinese government-to-government relations, but it is independent from diplomatic relations. Alliance behavior may be considered as a real, calculated, political tie while diplomatic relations may be regarded as more formal and less substantial.

Cooperation V (COV): ADMINISTRATIVE COOPERATION The only highly loaded variable on this factor is treaties of economic cooperation (.82). Note

that the treaties included are those of science, technology, finance and customs as well as trade. Since the variable represents the number of treaties and not the real interaction, the pattern is administrative than substantial. Thus this behavior reflects the subsystem of China's interaction field in the global international relations system in a way similar to a family system which identifies the blood relatives network but not the real, substantial relations. The fact that all dyads with high scores on this factor were communist nations with the one noticeable exception of Japan supports the above interpretation. It is then understandable to find that this administrative cooperative network shows a different pattern from that of the substantial cooperation (independent in a statistical sense).

Cooperation VI (COVI): COMMUNICATIONS NETWORK This sixth cooperative behavior pattern on which treaties of postal service and transportation alone loaded highly (.94) is very similar to the fifth, i.e., administrative cooperation. Both are formal networks for Chinese interaction with other nations. At one point, however, they differ from each other. The sixth pattern, labeled communication network, is purely administrative without any further political implication. It is a kind of housekeeping behavior of a member of the global community while the fifth cooperative pattern still includes some amicable commitment. Administrative cooperation is impossible between hostile nations, but the communications network has nothing to do with hostilities between the two nations.

Conflict I (CFI): PEOPLE'S LIBERATION WAR Two variables are loaded highly on this factor -- verbal support for anti-government elements (.83) and rebel support (.91). This is a typical pattern of people-to-people diplomacy for China. One of the indisputable objectives of China's

long-term foreign policy has been to spread communism, eventually, to achieve a worldwide "social revolution."⁷⁸

To promote this end the Chinese have employed a strategy of protracted struggle, "which is based on a belief in the ultimate success of persistent, cautious and flexible aggression against the imperialist countries."⁷⁹ As one of the instruments to carry out this struggle, China has made great use of "people's diplomacy," which is an informal, people-to-people (actually the Chinese government and the communist parties in non-communist countries) diplomacy.⁸⁰

Chinese support of anti-government elements and rebels in the object nations thus can be interpreted as a manifestation of her foreign policy goal of a worldwide liberation war.

⁷⁸This basic theme of China's foreign policy goal was expressed by Mao Tse-tung himself, as early as in 1949, saying that ". . . we must unite in a common struggle with those nations of the world who treat us on the basis of equality and with the people of all countries. This is to ally ourselves with the Soviet Union, to ally ourselves with all the New Democratic countries, and to ally ourselves with the proletariat and the broad masses of the people in other countries, to form an international united front . . . in order to destroy imperialism and its running dogs" (Mao Tse-tung, "On the People's Dictatorship," delivered on July 1, 1949. The English translation was taken from the China Digest, Vol. VI, No. 7). Halpern also clarified the long-term aim of China's foreign policy: ". . . to free China from foreign control and to make China once again great are the purposes of Chinese communist, as well as of the other Chinese governments. But in the communist's view, China can be freed only by associating herself with a world revolutionary movement aimed at transforming all existing societies. Further, in their view, China's greatness can be restored or assured only by her effective participation in this world movement . . . The long-range aim of the Chinese communists, is not merely to get along in the world claiming for their country as much respect as the conditions let them attain. They aim beyond that to transform the world and to dictate the forms of organization of other societies into proletariat world order" (Halpern, 1966, pp. 2-3). See also Barnett, 1962, p. 85, Hinton, 1966, pp. 117-8, and Boyd, 1962, p. 84.

⁷⁹Boyd, op. cit., p. 90.

⁸⁰See Boyd, ibid., p. 91, and Hinton, op. cit., p. 119.

In international relations, support of rebels may be regarded as one of the most hostile behaviors, just short of war, because the purpose of support is to topple the existing government. In this sense, the Conflict I behavioral pattern should be given close attention.

Conflict II (CFII): FORMAL CONFLICT The conflict behavior pattern on which negative communications (.97) and degree of concern (.68) loaded highly was labeled "formal conflict," because it represents manifested and publicized negative actions. The behavior is directed toward the government of the object and thus belongs in the government-to-government conflict⁸¹ category. With this factor we can measure the degree of hostility between China and the object nation's current government.

Time (TM) The ninth factor had only one variable, time (the last two digits of the calendar year), load highly on it (.99). Thus, this is obviously not a behavioral factor. The implication of this factor, however, is significant -- it tells us that no Chinese behavior is correlated with time. In other words, for the sixteen-year period, there has been no systematic change in any kind of Chinese foreign behavior, or technically, no portion of the Chinese behavioral variance is accounted for by time.

6.2 Cross-Time Examination of Chinese Behavior Toward Several Selected Dyads

In 6.1, we identified eight mutually independent Chinese foreign behavioral patterns. They were six cooperative patterns -- Penetration (COI), Formal Diplomacy (COII), Substantial Cooperation (COIII), Alliance

⁸¹One of the distinct Chinese foreign behavioral characteristics is the clear bifurcation between government-to-government and people-to-people behavior. Chinese negative communications have always specified that her target of attack is the government or some other organization.

(COIV), Administrative Cooperation (COV) and Communications Network (COVI) -- and two conflictful patterns -- Support of Liberation War (CFI) and Formal Conflict (CFII). With these dimensions, then, let us try to describe China's past behavior toward other nations. Because of limited space, only a few dyads will be selected for discussion.

6.2.1 China's Cooperation Behavior

China has increased considerably her penetration behavior (COI) since 1960. In the fifties, China was not ready to play a power role outside her boundaries and could not afford to exert influence on other nations. Thus, all dyads had low factor scores in the fifties, except for the dyads which included border neighbors, such as North Korea (KON), North Vietnam (VTN) and Outer Mongolia (OUT). Since 1960, however, China's penetration behavior began to show very distinctive patterns for each dyad. For example, the scores for China-Cuba (CHN→CUE) and China-Burma (CHN→BUR) soared, those for China-Pakistan fell and then rose while the curves for China-North Korea (CHN→KON) sloped downward. In 1965, the patterns become much more distinguishable. Figure 3 shows these fluctuations across time.

China's formal diplomatic behavior pattern showed a gradual increase in China's diplomatic activities. As we can see in Figure 4, all dyads began with low scores in 1950, then gradually moved upward. In most cases, China's behavior toward communist nations showed a steady increase, while her behavior toward the Western and the neutral nations fluctuated mildly below the average point (the "0" line is the mean line, because the mean of factor scores is always zero).

Figure 5 shows China's substantial cooperation patterns (COIII) across the 16-year period. In this figure, one exceptionally high score

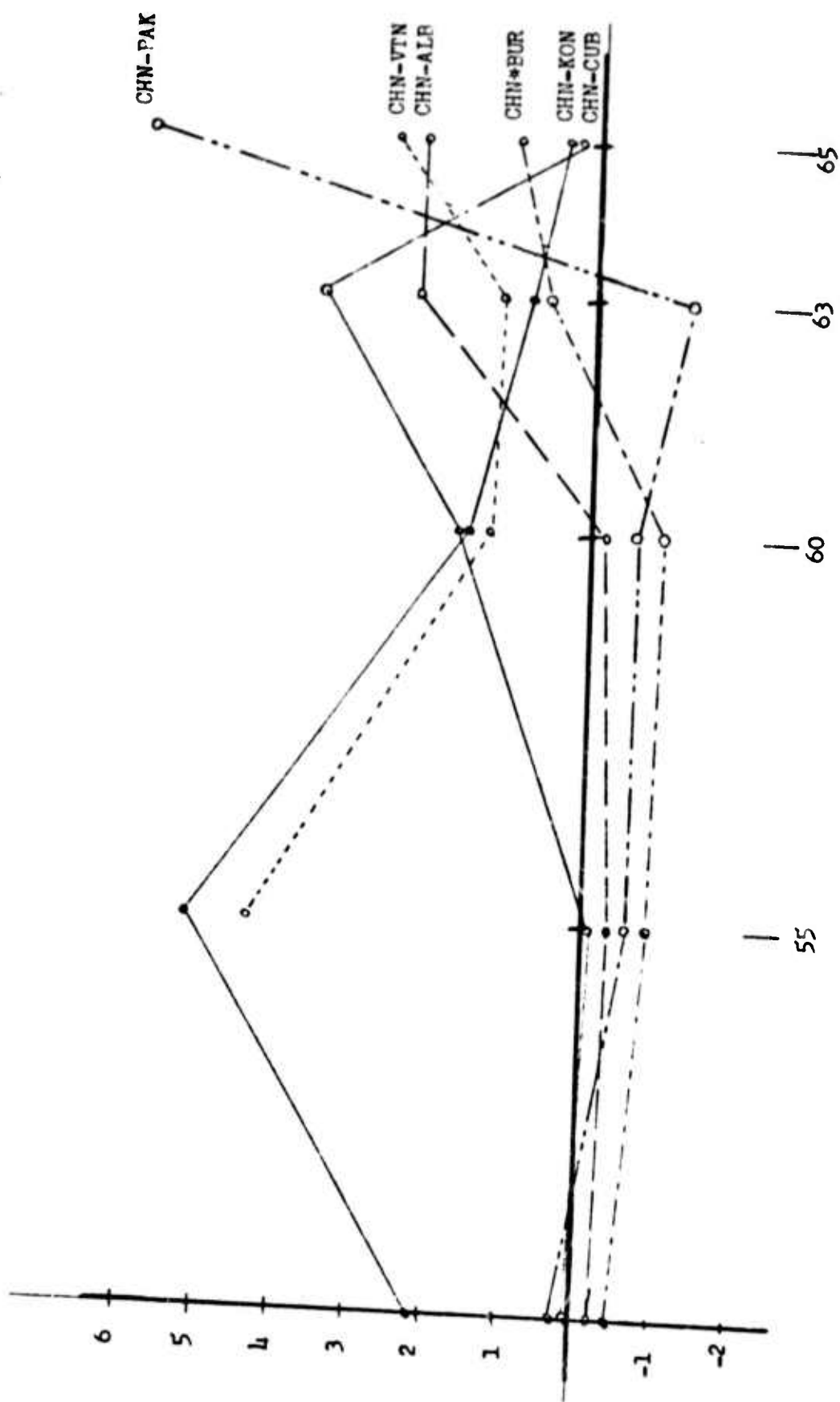


FIGURE 3

CHINA'S PENETRATION BEHAVIOR

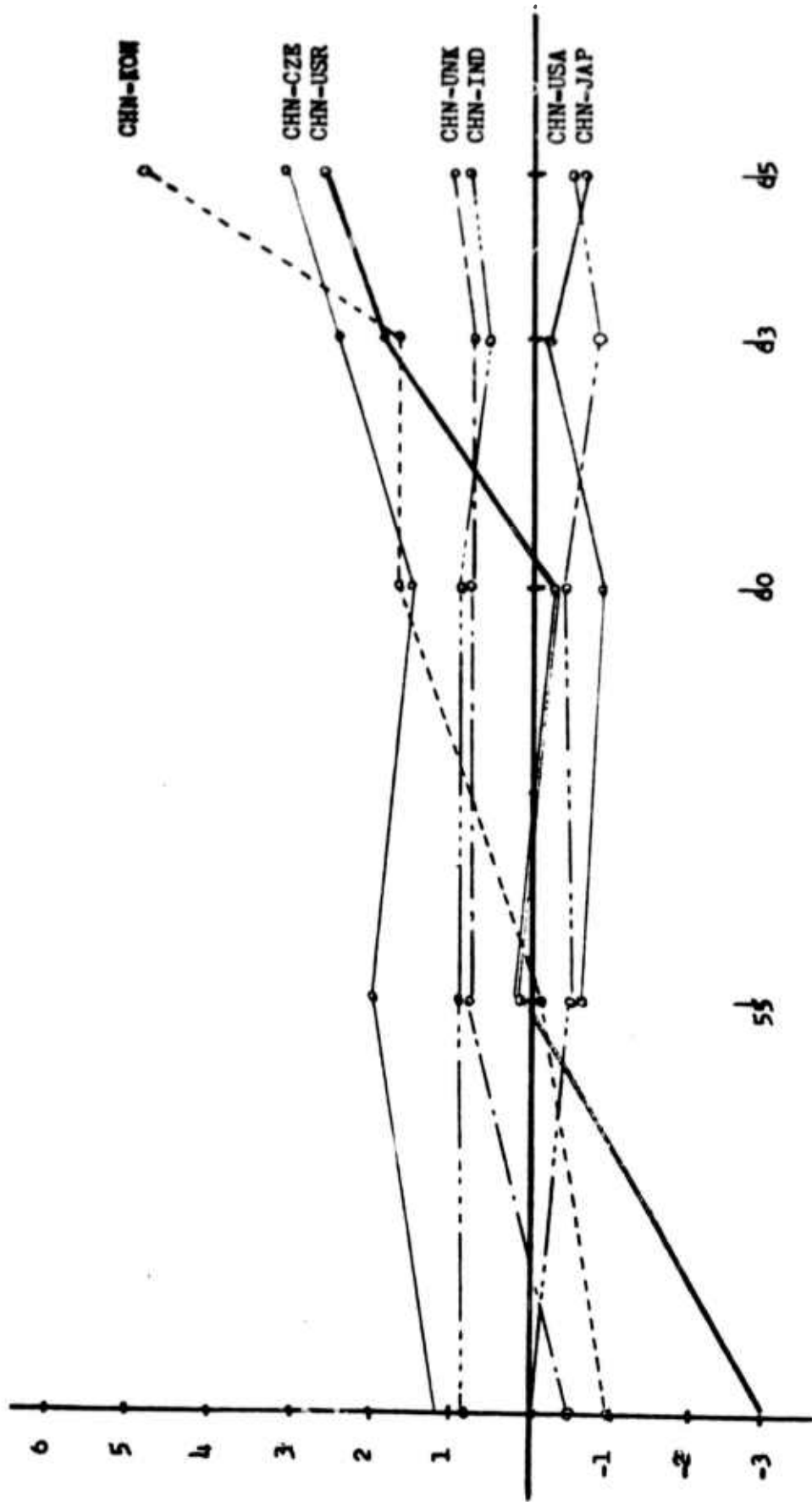


FIGURE 4
CHINA'S FORMAL DIPLOMACY

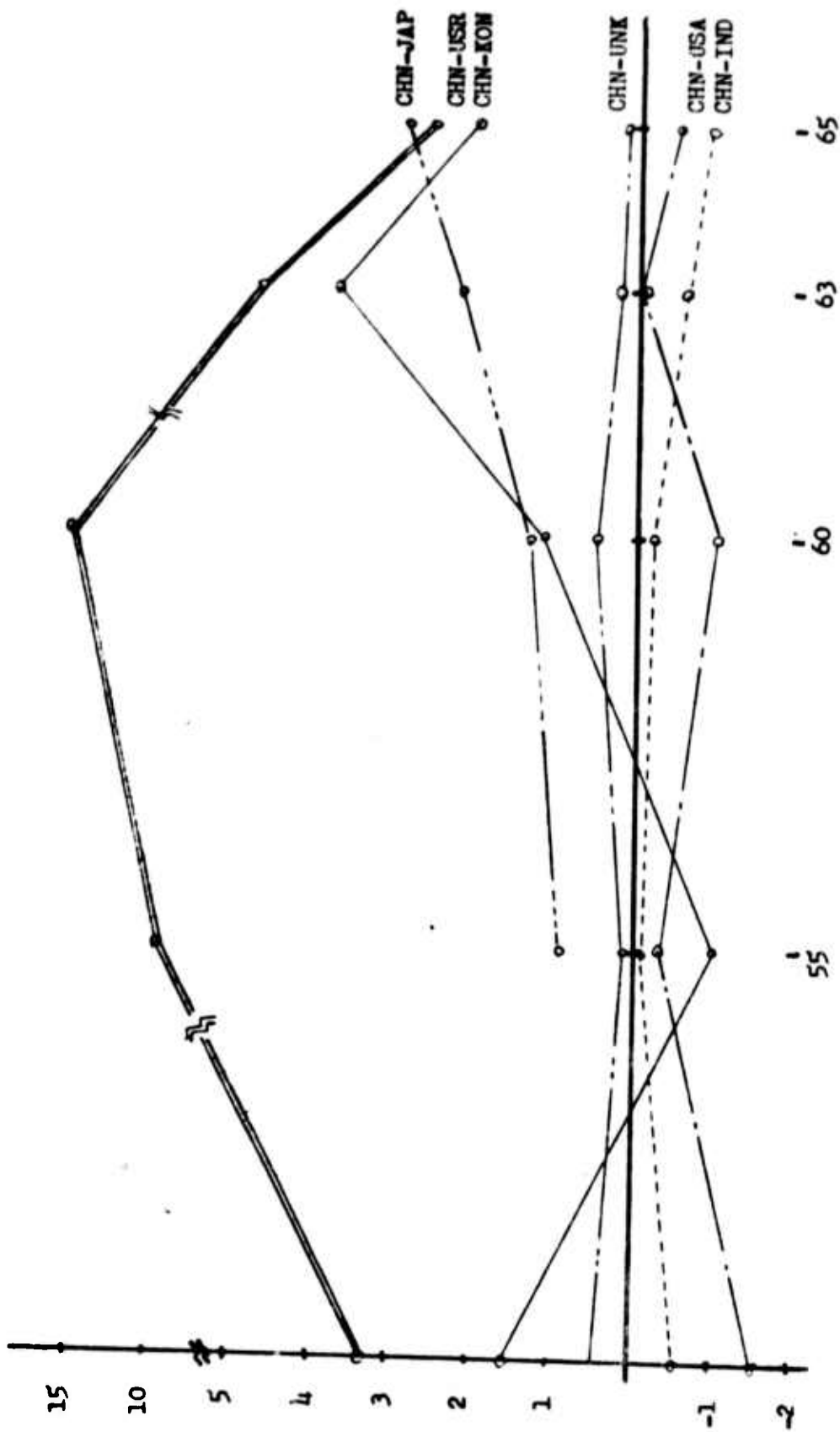


FIGURE 5
CHINA'S SUBSTANTIAL COOPERATION

pattern is the Soviet Union dyad, which is not difficult to understand when we examine the history of Sino-Soviet Union relations after World War II. Another noticeable curve, the China-Japan (CHN→JAP) dyad, is the only steadily upward curve. The China-North Korea (CHN→KON) dyad also shows drastic changes across time -- falling sharply to the bottom, and then soaring just next to CHN→USR, then dropping again.

China's political maneuvers during the period are well reflected by her behavioral scores on the alliance factor (COIV). Figure 6 shows how China's relation with the USSR has cooled and how amicable China's honeymoon with Indonesia (CHN→INS) has been (note the magnitude). For the China-North Korea relation, it is interesting to see that the curve on the alliance factor almost overlaps the substantial cooperation curve in Figure 5.

In the early fifties, China's administrative cooperation (COV) was limited to communist nations, with the Soviet Union being the sole major patron. With greater independence over time, she has gradually expanded her administrative cooperation domain to the outside world at large. Figure 7 shows this basic direction of her sphere of interaction.

The building of China's communications network started from null in 1950; all dyads except for that with USSR had near zero values (means). Then, at two separate times, in the mid-fifties and in the mid-sixties, China expanded this network, as shown in the bimodal configurations of plottings in Figure 8. Because this behavior was measured mainly in terms of the number of treaties of transportation and communication signed, and because once the network is established, it remains open, we cannot interpret the low valley between the bimodal peaks as shrinkage of China's communications network. The total picture simply shows us that China's

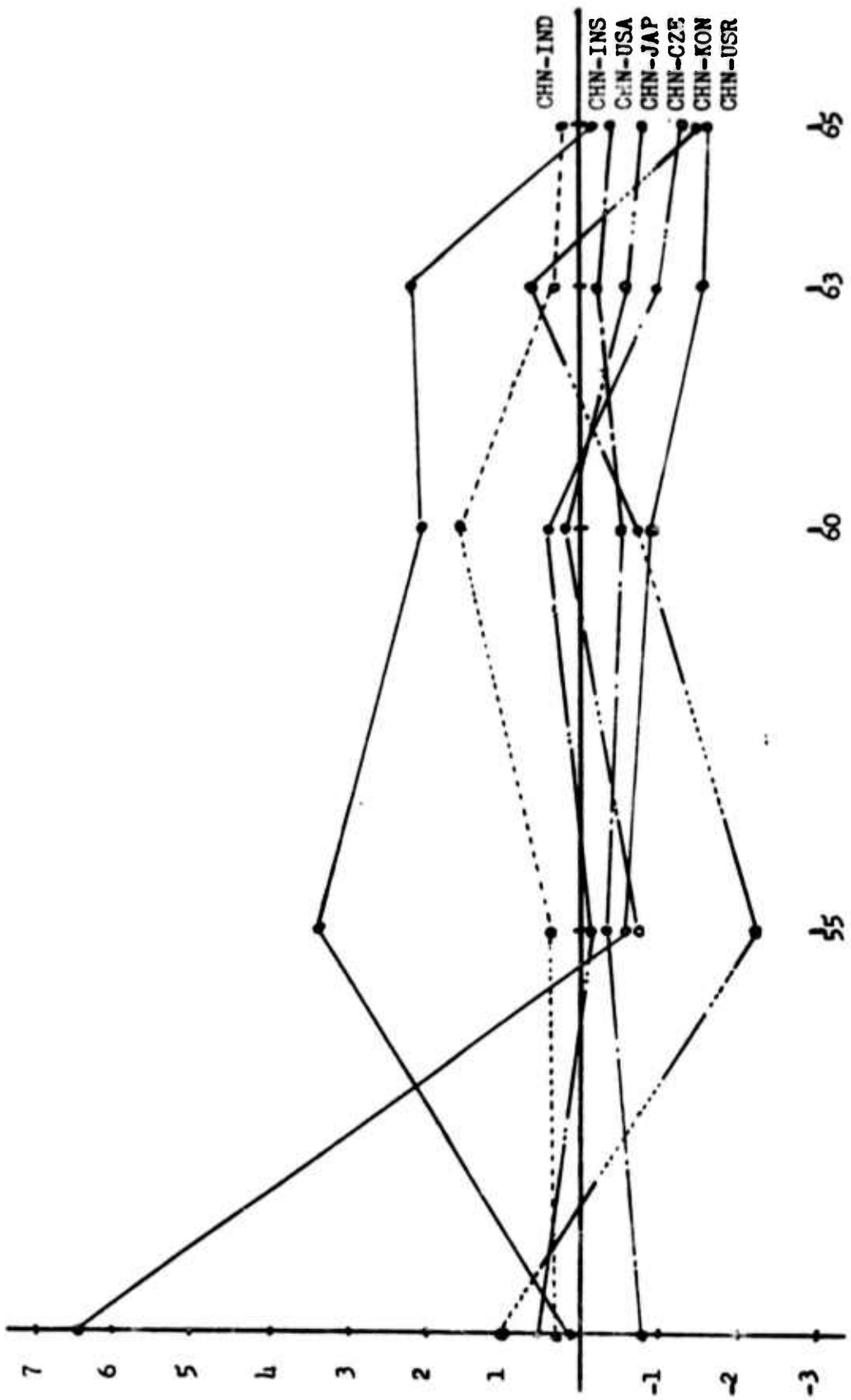


FIGURE 6
CHINA'S ALLIANCE BEHAVIOR

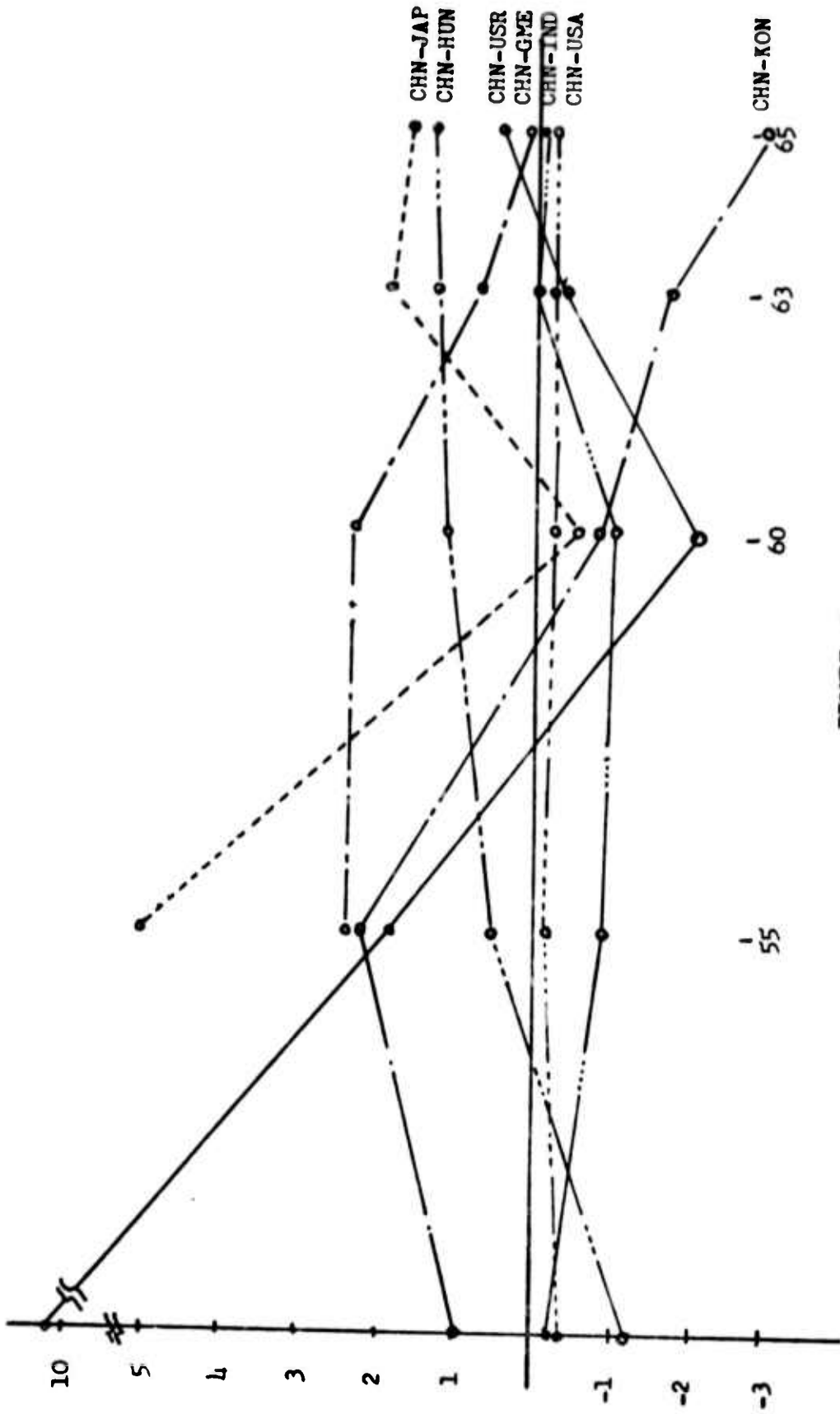


FIGURE 7
CHINA'S ADMINISTRATIVE COOPERATION

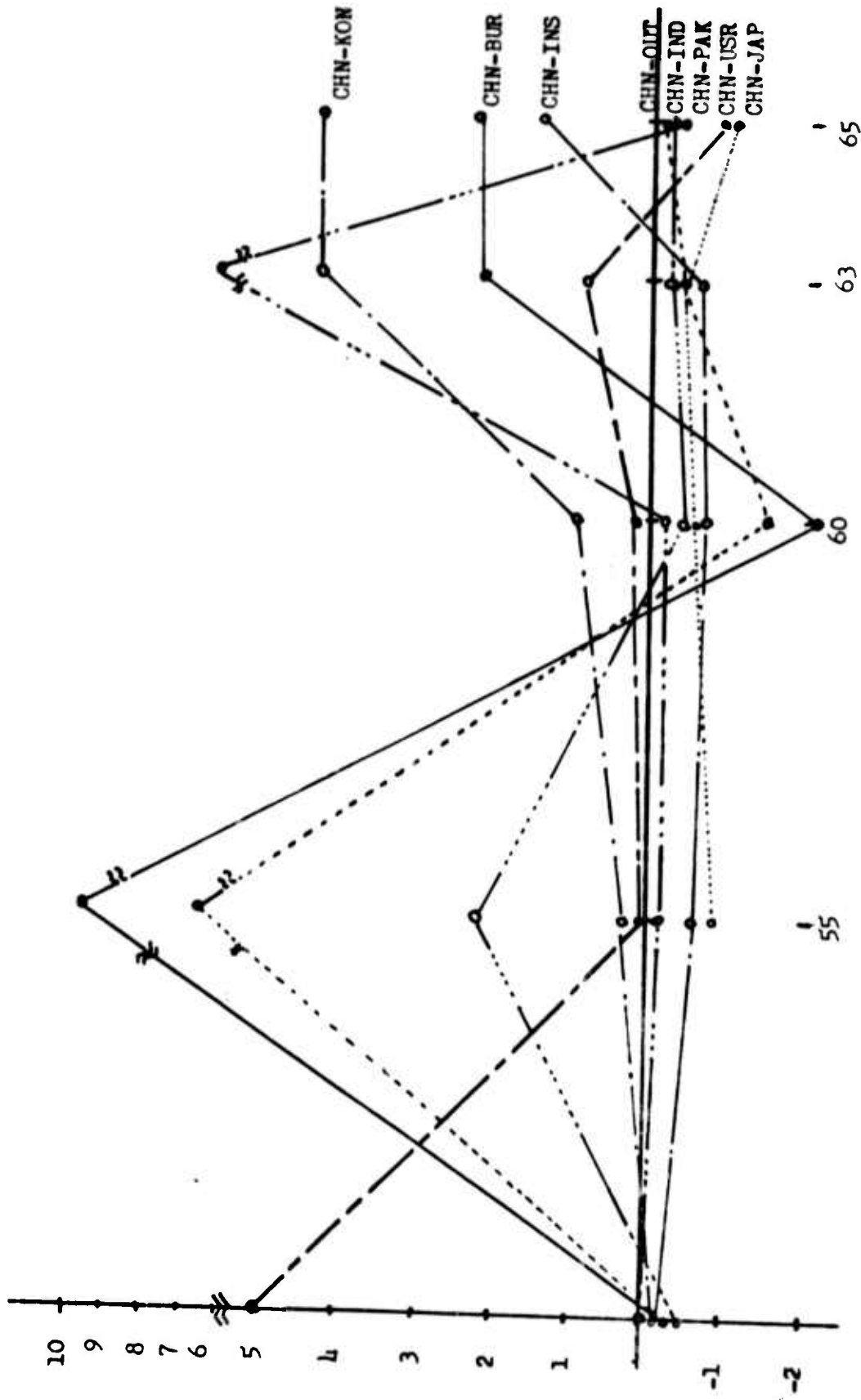


FIGURE 8
CHINA'S COMMUNICATION NETWORK BUILDING

expansion of her communication network is not steadily growing, but that there have been two discontinued campaigns.

6.2.2 China's Conflict Behavior

The two patterns of China's conflict behavior were support of liberation wars (CFI) and formal conflict behavior (CFII). The general trend of China's liberation war behavior showed V-shaped curves with high right arms. This means that in the early fifties, she supported liberation wars quite actively, stayed relatively quiet until the early sixties, then vigorously reactivated her support since 1963. Also, we find that the liberation wars heavily supported by China in the early fifties regained less support in the sixties, while those wars which received relatively little attention in the early period enjoyed much stronger support in the latter period. This implies that the Chinese targets of liberation wars have shifted. For instance, the wars in Pakistan and South Korea received relatively high attention from China in 1950, but had the lowest rankings on her support scale in the sixties. On the other hand, Latin American nations, such as Colombia, Dominican Republic were almost neglected in the fifties, but obtained China's strongest endorsement in the sixties. Figure 9 shows several examples of the patterns of China's support of liberation wars.

Another conflict behavior pattern, labeled formal conflict behavior, shows completely different curves for the period studied. As shown in Figure 10, the main targets of China's formal conflict (or what may be called negative diplomacy in a sense that the behavior consists mainly of publicized negative communication, verbal attack, and negative propaganda, all increasing what ordinary formal diplomacy tries to dampen) were the USA and Japan. Except for these two, in general China has

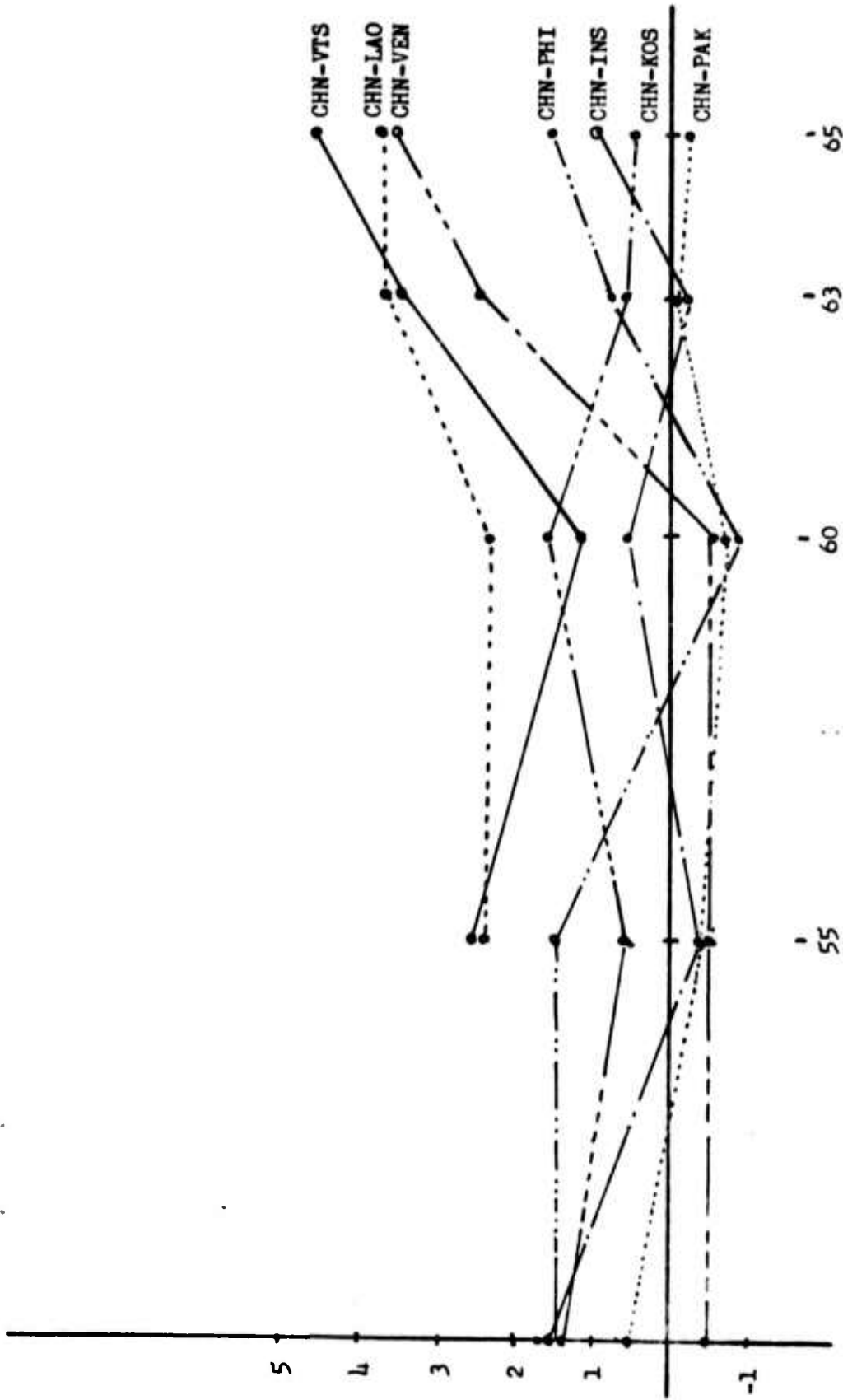


FIGURE 9
CHINA'S SUPPORT OF LIBERATION WAR

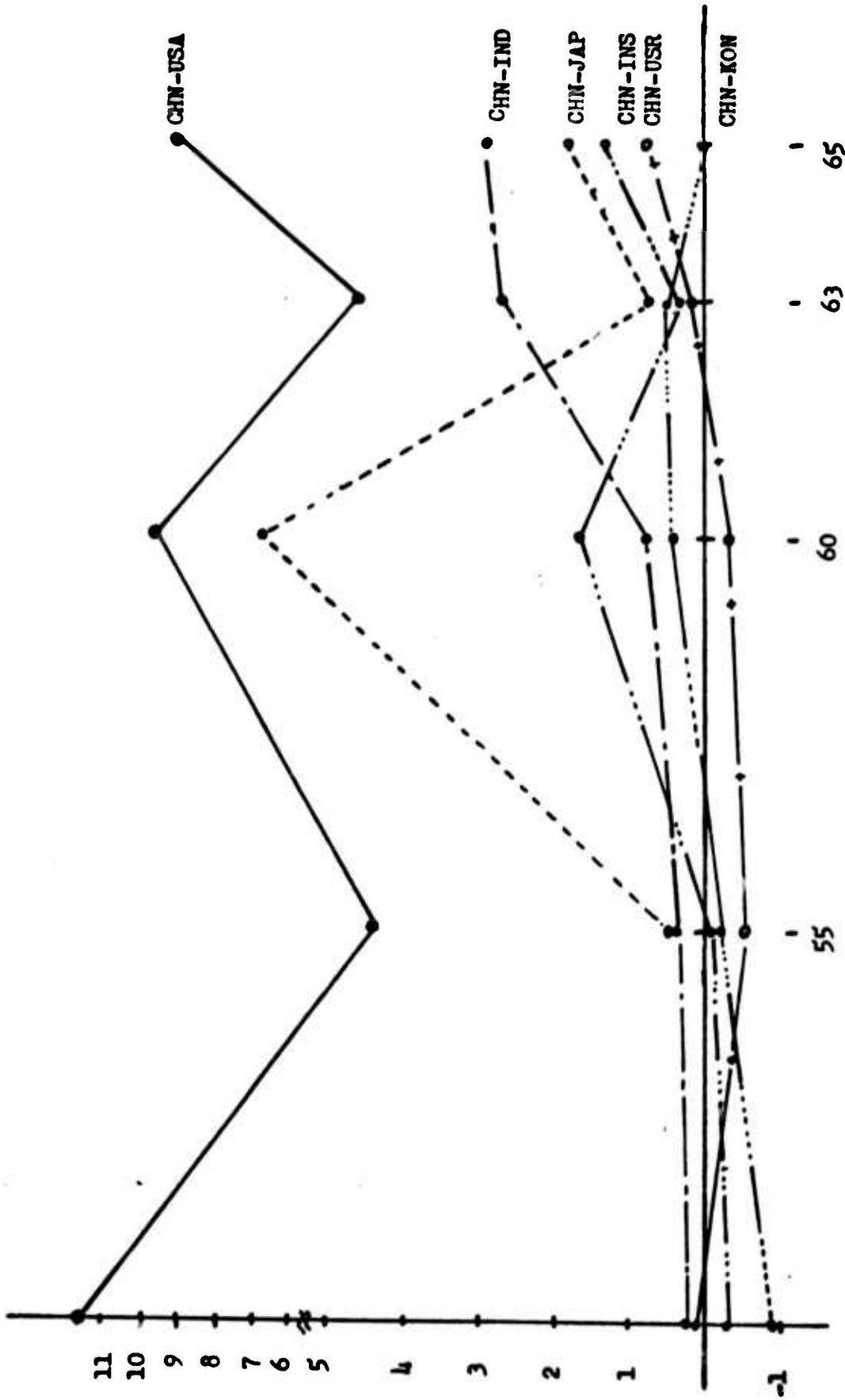


FIGURE 10
CHINA'S FORMAL CONFLICT BEHAVIOR

increased her formal conflict level gradually during the sixteen-year period. Among these rising curves, the one for the China-India dyad (CHN-IND) is most prominent. Factor scores of this dyad already exceed those of the China-Japan dyad (CHN-JAP) in 1963. Also interesting is that the China-USSR and the China-North Korea dyads show exactly opposite shapes; when the former increased, the latter dropped and vice versa. This implies that China's behavior toward the Soviet Union and North Korea are mutually exclusive or compensative, and this fact leads us to many feasible hypotheses about the linkages among dyadic behavior patterns, such as game theory, balance of power theory, and alliance theory.

VII. ATTRIBUTE DISTANCES OF NATIONS

In both field theory and status-field theory, the main theme is that a nation's dyadic behavior toward an object nation is a function of a linear combination of a set of attribute distances between the two nations. In the previous section, dyadic behavior was operationalized through factor analysis. In this section, the attribute distances will be operationalized.

As already discussed in 3.2, the concepts of the attribute distances are to be operationalized through factor analysis of the total attribute space; the basis factors generated are the attributes to be used in the model.

In order to define the basis dimensions, sixty-nine attribute variables were factor analyzed by the principal component method and the original factors were rotated orthogonally as was done for the behavioral space variables. Each nation/year was regarded as an independent case, i.e., nation A in 1950 and in 1955 were treated as independent cases. Thus, the data matrix had 461 cases and 69 variables.

Through the principal component analysis twenty factors were delineated,⁸² and these factors were rotated with the varimax orthogonal rotation criteria.⁸³ Subsequently, eight factors were eliminated because each accounted for less than 2.5% of the total variance, and furthermore, none of them represented any meaningful cluster of variables. Each of the twelve remaining factors, then, were labeled substantively by examining highly loaded variables on the dimensions.⁸⁴ The labels, their abbreviations and the highly loaded variables with loadings are given in Table 3.

VIII. EXPLANATION OF CHINA'S BEHAVIOR: A FIELD THEORETIC VIEW

As was discussed in Section IV, social field theory tells us that a nation's dyadic behavior patterns are linearly related to her attribute distances from other nations. And with status-field theory we can generate three hypotheses for China's cooperation, conflict and interaction behavioral patterns, each of which relates these behavioral patterns to specific sets of attribute distances. We have also examined China's actual past behavioral patterns toward all other nations in Section VI, and her attribute distances from all these nations in Section VII. Let us now examine how far field theory and status-field theory can explain China's real behavior in terms of her attribute similarities and differences from other nations.

⁸²Twenty factors accounted for 79.1% of the total variance. The eigenvalue of the twentieth unrotated factor was 0.832.

⁸³For varimax rotation criteria, see Rummel, 1971, pp. 390-4.

⁸⁴The sum of contributions by the twelve remaining factors in the total variance is 63.49%.

TABLE 3
 LABELS OF TWELVE ATTRIBUTE SPACE
 BASIS DIMENSIONS

<u>FACTOR #</u>	<u>FACTOR LABELS</u>	<u>ABBR. CODE</u>	<u>HIGH LOADING VARIABLES</u>
I	Communism	COM	non-communist regime (.93), Russian titles translated/foreign titles translated (.84), communist party membership/population (.82), system style (.81), constitutional status (.80), bloc membership (.80), US aid received/USSR and US aid received (.68), freedom of opposition (.67)
II	Economic Development	DEV	agricultural population/population (.88), dwellings with running water/ dwellings (.85), GNP/population (.84), telephones/population (.81), energy consumption/population (.80), bureaucracy (.80), illiterates/population 10 years of age or older (.77)
III	Power	POW	defense expenditure (.95), national income (.92), balance of investments (.90), population x energy production (.76)
IV	Catholic Culture	CAT	geography-Y (.88), air distance from U.S. (.84), Roman Catholics/population (.74) geographical distance from Peking (.66)
V	Diversity	DIV	membership of largest language group/ population (.82), languages (.81), largest ethnic group membership/ population (.66), ethnic groups (.66)
VI	Density	DNS	population/national land area (.83), arable land/total land area (.76), railroad length/national area (.74)

TABLE 3 (continued)

<u>FACTOR #</u>	<u>FACTOR LABELS</u>	<u>ABBR. CODE</u>	<u>HIGH LOADING VARIABLES</u>
VII	Chinese Sphere	CHI	geography-X (.84), Chinese population/total population (.82)
VIII	Political Stability	STB	legitimacy of present government (.80), legality of government change (.75) military personnel/population (.60)
IX	Population	POP	population (.80), economic aid received (.63)
X	Neutralism	NEU	foreign college students/college students (.66), membership in Neutral bloc (.61)
XI	Monarchy	MON	monarchy or not (.68), religions (.47)
XII	Domestic Conflict	DCF	riots (.80), general strikes (.67), demonstrations (.54)

8.1 Field Theoretic Models of China's Foreign Behavior

In the field theory model (equation 15), the weighting parameters O (unique 'behavioral preference system' of the actor nation) and P (unique 'perception framework' for the actor nations) are to be determined empirically by canonical analysis of real world data (see 4.1). Once O and P are determined for any actor nation, we then can have models which show us the empirical substantive pattern relationships between behavior and attribute distance for that nation. Because the models so generated are general we can utilize them for explanation and prediction of the actor's future behavior.

As the theory dictates, eight of China's behavioral factors (see Section VI) were canonically regressed upon the twelve factors of attribute distances (see Section VII). A summary of the canonical regression analysis is presented in Tables 4 and 5. Since the number of behavioral factors was eight and smaller than that of the attributes, we have eight independent canonical regression equations, each of which represents the best possible pattern relations between a set of behavioral factors and a set of attribute distances.⁸⁵

Let us first look at the overall relations between the behavioral factors and the attribute distance factors. The trace correlation⁸⁶ was

⁸⁵Mathematically these equations have the maximum canonical correlations according to the canonical regression criteria. For further explanation, see Rhee 1971, 3.4.3 (pp. 55-66) and 4.4 (pp. 71-74).

⁸⁶The formula for calculating the trace correlation (\bar{r}) is

$$r = \left(\sum_{k=1}^q r_k^2 / q \right)^{1/2}$$

where r_k is the k -th canonical correlation and q , the number of canonical equations.

TABLE 4
RESULTS OF CANONICAL REGRESSION ANALYSIS
BETWEEN 8 BEHAVIORAL FACTORS AND 12 ATTRIBUTE DISTANCE FACTORS

Number of Eigenvalues Removed	Eigenvalue	Corresponding Canonical Correlation	λ^a	x^2^b	d.f. ^c	Z for d.f. $\geq 30^d$
1	0.72136	0.849	0.067	1201.88	96	35.208
2	0.57606	0.759	0.242	632.61	77	23.201
3	0.21600	0.465	0.570	250.30	60	11.465
4	0.14089	0.375	0.727	141.89	45	7.412
5	0.11471	0.339	0.847	74.23	32	4.247
6	0.03412	0.185	0.956	19.96	21	-0.086
7	0.00843	0.092	0.990	4.49	12	-1.799
8	0.00161	0.040	0.998	0.72	5	-1.803

Trace Correlation = 0.47607

^aThe formula for λ is

$$\lambda = \prod_{k=1}^q (1-r_k^2)$$

where q is the number of canonical correlations, r_k is the k -th correlation.

^bChi-square equals $-\{n-0.5(p+q+1)\} \log_e \lambda$
where n = the number of cases (456), q = the number of behavioral dimensions (= 8), and p = the number of attribute dimensions (distances; = 12).

^cd.f. = degrees of freedom

$$d.f. = \{p-(k-1)\}\{q-(k-1)\}$$

^dCorresponding areas under the normal curve.

TABLE 5

CANONICAL REGRESSION COEFFICIENTS
FOR 8 CANONICAL PATTERN EQUATIONS*

ATTRIBUTE DISTANCES	CANONICAL VARIATES							
	1	2	3	4	5	6	7	8
1 ECON DEVELOP	-0.155	0.157	-0.270	0.370	-0.151	0.399	0.401	0.107
2 COMMUNISM	0.924	0.311	-0.045	-0.130	0.050	0.157	0.084	0.154
3 POWER	0.293	-0.848	0.090	0.140	-0.111	0.102	0.136	-0.005
4 CATHOLIC	-0.097	-0.048	0.245	0.018	0.527	0.489	-0.403	-0.032
5 DOM CONFLICT	-0.042	-0.188	-0.155	-0.167	-0.172	-0.094	-0.074	0.842
6 DIVERSITY	0.017	-0.071	0.201	-0.111	-0.243	0.555	0.141	-0.056
7 CHINESE	-0.244	0.238	0.730	-0.165	0.086	-0.006	0.175	0.341
8 DENSITY	-0.050	0.015	-0.328	0.279	0.281	0.328	0.144	0.295
9 POL STABILITY	0.006	0.033	-0.271	-0.106	-0.254	0.177	-0.590	0.064
10 MONARCHY	0.079	0.031	0.103	0.519	0.303	-0.345	0.087	0.079
11 POPULATION	-0.312	0.207	0.298	-0.082	-0.362	-0.020	0.261	-0.231
12 NEUTRALISM	0.122	0.150	0.300	0.628	-0.422	0.014	-0.404	0.092

BEHAVIORAL FACTORS	CANONICAL VARIATES							
	1	2	3	4	5	6	7	8
1 CO3 SUBSTAN	0.429	-0.187	-0.294	0.248	0.742	0.035	-0.263	-0.115
2 CF1 LIBERAT	0.134	0.191	0.734	0.603	0.074	0.188	0.050	0.029
3 CO1 PENETRA	0.082	0.152	-0.348	0.192	-0.364	0.766	-0.251	-0.175
4 CF2 FORM CFL	-0.266	0.891	-0.167	-0.034	0.316	-0.075	-0.029	-0.000
5 CO4 ALLIANCE	0.035	0.049	-0.357	0.630	-0.354	-0.540	0.047	-0.231
6 CO6 COMMUNIC	0.192	0.038	-0.283	0.185	-0.013	0.108	0.393	0.825
7 CO2 DIPLOMAC	0.740	0.307	0.129	-0.290	-0.291	-0.231	-0.328	0.105
8 CO5 ADMIN CO	0.368	0.15	-0.046	-0.149	0.045	0.125	0.775	-0.458
r	.85	.47	.34	.38	.19	.09	.04	

*Original data for this canonical analysis were in orthogonally rotated factor score form. Thus, all the variables were standardized and mutually orthogonal and as a result canonical coefficients may be interpreted as correlations. In other words, this coefficient table is almost the same as the canonical structure matrix.

.48, and the trace correlation squared (\bar{r}^2) was .22. This means that about twenty-two percent of China's behavioral variances in the eight-dimensional space was accounted for by the linear models of social-field theory. Another statistic, the communality estimate (H-square),⁸⁷ tells us the proportion of the total variance in the behavioral or attribute spaces accounted for by the canonical equations. The proportion of the variance in attribute distance space contained in the eight canonical equations, which was calculated by summing H-SQ over all eight equations, was 65.6 percent.⁸⁸ This means that about one-third of the total variance in China's attribute distance space represented by twelve factors was not involved in the linear patterns we produced through the canonical analysis. If we examine the communalities of each of the factors, we can see that communism (H-SQ, .95) and power (.89) played great roles in the pattern equations, but a great portion of the variances in population (.31) and density (.45) were not involved in the pattern models.

⁸⁷The formula for calculating the H-SQ is

$$H-SQ_B = \sum_{k=1}^q \beta_k^2 \text{ for behavioral space and}$$

$$H-SQ_A = \sum_{k=1}^p \alpha_k^2 \text{ for attribute distances,}$$

where β_k and α_k are the loadings of the k-th variable (factor) on corresponding canonical variates respectively. The sum of H-SQ over all factors in the attribute and behavioral spaces, then, tell us the proportion of variance in each space accounted for by the pattern. When we weight the H-SQ of each canonical variate by the ratio of numbers of vectors involved, we have the proportion of the total variance represented by each canonical regression equation.

⁸⁸The H-SQ for all canonical variates in the behavior space is 1.00 because the dimensionality of the space is smaller than that of the attribute space.

As shown in Table 5, the canonical correlations of the eight regression equations were .85, .76, .46, .38, .34, .18, .09, and .04. If we square these correlations and multiply them by 100, we have the proportion of the total variance in the two spaces accounted for by the corresponding equations. For example, about 72.3 percent of the variance was explained by the first canonical regression equation, 57.8 percent by the second, and so on. Out of the eight equations, however, the last three were eliminated because the corresponding canonical correlations were not statistically significant at the .01 level.⁸⁹

The first pattern relation between Chinese foreign behavior and her attribute distance from others is that China's formal diplomacy is mainly explained by the bloc position distances; the closer the object nation is to China on the communism dimension, the stronger is China's formal diplomatic behavior. The equation for this is

$$.74 \text{ DIP} + .43 \text{ SUB} + .37 \text{ ADM} \approx .92 \text{ COM} + .31 \text{ POP} \quad (r=.85)^{90} \quad (21)$$

where DIP stands for formal diplomacy, SUB means substantial cooperation, ADM is administrative cooperation, COM is communism, and POP is population. Because all three factors on the behavioral side are of a government-to-government cooperation type we can name this model, China's formal

⁸⁹The Z value of the fifth canonical correlation with thirty-two degrees of freedom was 4.25 and corresponding P ($Z > 2.45$) was 0.01. The sixth canonical correlation was -0.09 and it was not significant even at P = 0.10 level.

⁹⁰The variables (factors), the coefficients of which are greater than .30, are included in the illustrated models. The figure in parentheses is the canonical correlation. The \approx sign indicates that the equation is an approximation in the sense that we ignored the less important variables. Some of the signs of the canonical regression coefficients in the equation were adjusted because they were reversed through the factor rotations and it was necessary to restore the original signs to get the correct meanings out of the models.

cooperation pattern. On the right side of the equation, the most prominent contributor is the communism factor, and thus we can also call the equation, China's bloc politics pattern. This pattern relation is very salient, for more than seventy-two percent of China's formal cooperative behavior is explained by a single attribute distance vector, communism.

With the above regression equation, we can estimate China's dyadic formal cooperative score for each of the object nations from China's attribute distance on the communism dimension. Figure 11 plots the estimated score (formal cooperation pattern score) against the distances on the communism dimension (bloc affiliation). Since we included all dyads for the five different time points ('50, '55, '60, '63, and '65) independently in the data matrix, we can also see the cross-time shift of one particular dyad in the two-dimensional space bounded by the cooperative behavioral and bloc affiliation patterns.

As expected from the high canonical correlations all dyads align themselves fairly well along the forty-five-degree line which is the perfect prediction line. Especially for the groups consisting of one dyad over five time points, the overall association between the bloc affiliation and China's formal cooperative behavioral scores is strong. However, within the group (for one dyad across time), the association is not clear. For instance, the China-Poland dyad shows that change in bloc affiliation has nothing to do with the fluctuations in the formal cooperative scores. One thing, however, is quite clear. China's formal cooperative behavior toward a particular nation is bounded by the limits set up by the bloc affiliation distance. For example, China's formal cooperative behavior toward the U.S.S.R. does not go beyond the limit of 3-5, when their bloc affiliation remains between 3-5 for the sixteen years. Thus, we can say

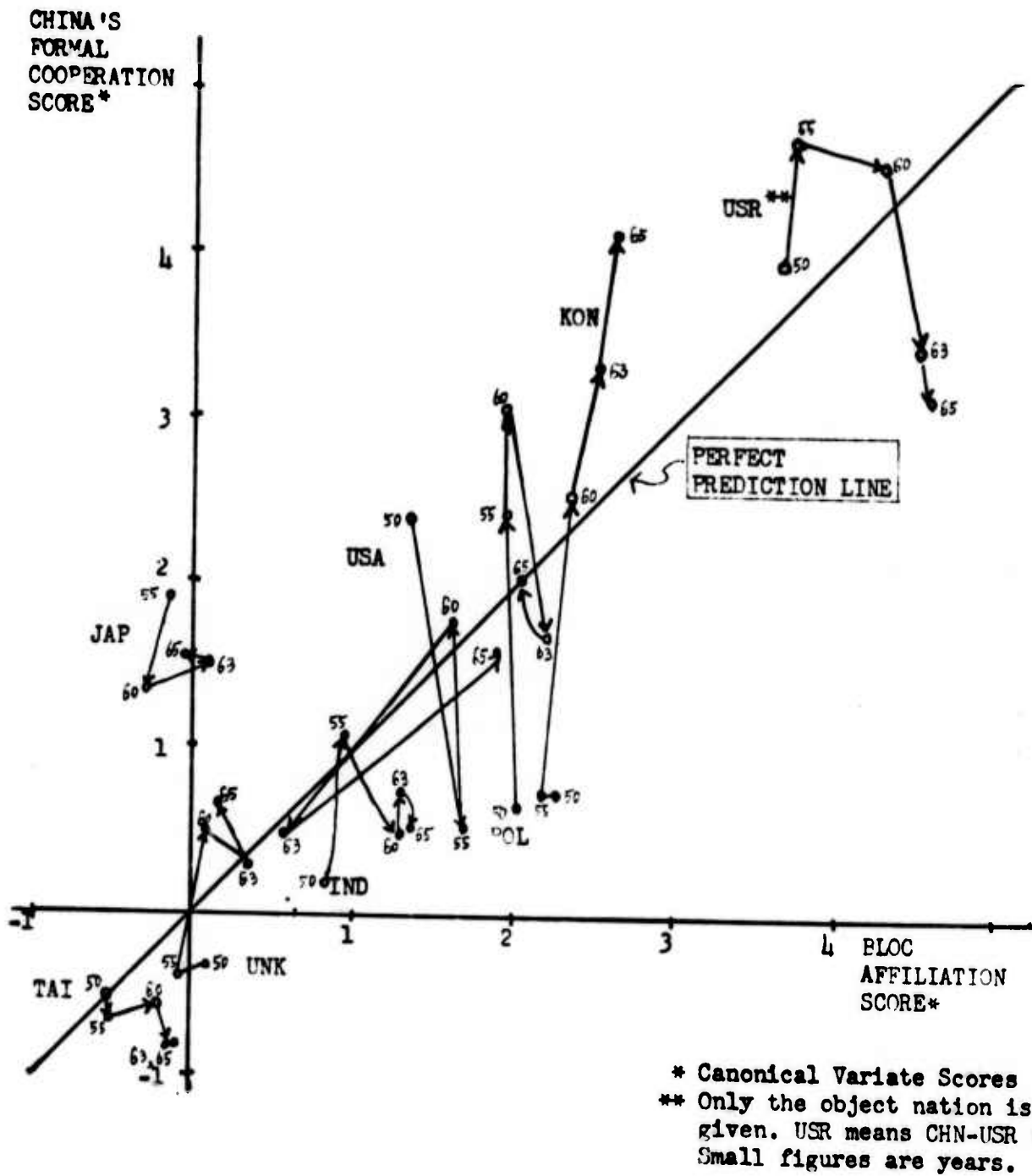


FIGURE 11

CHINA'S BLOC POLITICS: FORMAL COOPERATION PATTERN

that China's bloc affiliation distance from an object nation helps to explain and predict the degree of China's formal cooperative behavior toward that nation, but only within a certain boundary and we must still look for other causes.

The second model is the one that shows patterned relations between China's conflict behavior and power parity. The equation for this relation is

$$.89 \text{ CFL} - .31 \text{ DIP} = .85 \text{ POW} - .31 \text{ COM} \quad (r=.76) \quad (22)$$

where CFL stands for China's dyadic formal conflict behavior, POW is the power distance vector and DIP and COM are the same as in equation 21. With the relatively high canonical correlation (.76), the pattern relationship between conflict behavior and power distance represented by the equation is very salient; about 57.8 percent of the formal conflict behavior is explained by the power distance. The loadings of both the formal conflict behavior and the power distance vector are especially high. This means that most of the variances in the two vectors (79.2 percent of the formal conflict, 72.3 percent of power distance) are involved in the model. Beside the conflict and power factors, there are two more elements, formal diplomacy on the behavioral side and communism on the attribute distance side of the equation. The loadings of both factors, however, are relatively low (both .31); about 9.6 percent of the variance of each factor was included in the model.

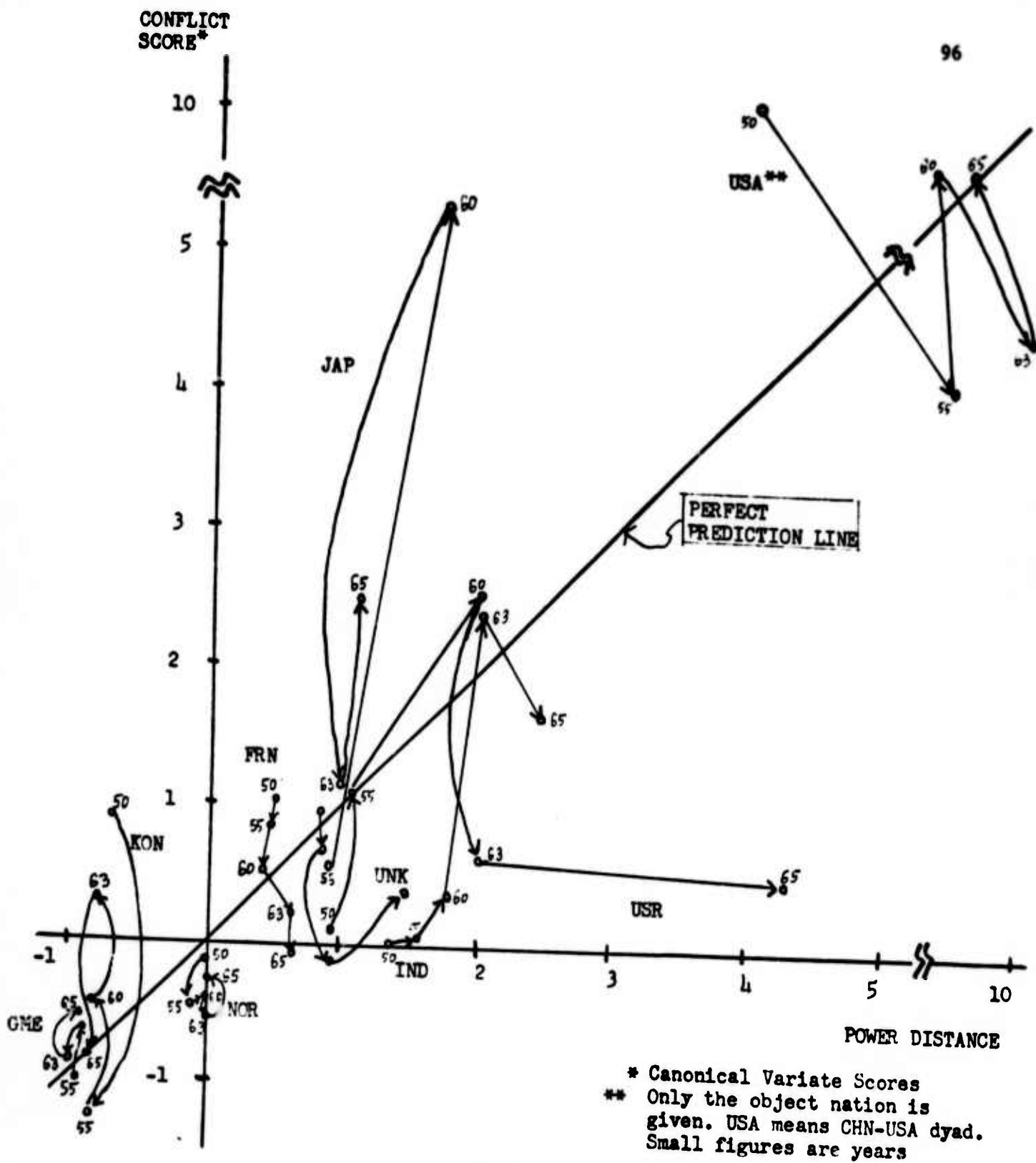
Therefore, the model can be called either the formal conflict behavioral pattern, or the power politics pattern. What, then, does the equation say about China's formal conflict and power politics?

It says that the greater the object nation's power, the greater China's formal conflict behavior toward that nation. The meaning of the equation becomes clearer when we examine China's formal conflict behavioral scores and power distances for all dyads calculated from equation (22). Figure 12 plots China's formal conflict scores for several selected dyads against the corresponding power distance from China. All dyads align themselves well along the forty-five-degree perfect prediction line, with a few exceptions such as China-Japan(60) and China-USSR(65). This shows that power distance is a good indicator of China's dyadic conflict behavioral level.

In order to see the dynamic aspect of field theory, the same dyads for different time points are connected by arrows in a chronological sequence. As we found in China's formal cooperative behavioral pattern, the dyads move within a limited range on the conflict level axis bound by power distance. For instance, the conflict level for China-USA dyads does not go beyond the 4-10 range which is corresponding to the 4-10 range on the power distance axis; and China-Norway and China-East Germany dyads move around within a small circle close to the perfect prediction line.

Within the delimited range, however, the dyads move almost randomly across time. In other words, a shift in power distance does not explain well a shift in the conflict level. This implies that for each object nation, China's conflict level is affected by factors other than power distance. In order to gauge more accurately the shifts on the conflict pattern of a dyad across time, we have to look for an auxiliary theory to the general model based on power distance.

The third pattern model delineated through the canonical analysis is



* Canonical Variate Scores
 ** Only the object nation is given. USA means CHN-USA dyad. Small figures are years

FIGURE 12
 CHINA'S POWER POLITICS: FORMAL CONFLICT PATTERN

$$.73 \text{ LIB} + .36 \text{ ALI} + .35 \text{ PEN} \text{ ;}$$

$$.73 \text{ CHI} - .33 \text{ DNS} - .30 \text{ NEU} + .30 \text{ POP} \quad (r=.47) \quad (23)$$

where LIB stands for support of liberation wars, ALI is alliance, PEN, penetration, CHI, Chinese sphere of influence, DNS, population density, NEU, neutralism, and POP is population.

Let us examine the left, behavioral side of the equation first. The leading factor of the combination is Chinese support of liberation wars. This is obviously a most hostile behavior. The other two elements in the combination -- alliance and penetration --, however, are cooperative behaviors. Although the weighting of LIB is much greater (.73) than those of the other two (.36 for ALI and .35 for PEN), the combined contribution by alliance and penetration is almost equal to the contribution by support of liberation. Thus, a dyad with a high value on any one of the dimensions (either on conflictful LIB or amicable ALI and PEN) tends to have a high canonical variate score.

Of course if any dyad has high values on all three dimensions, it will have a very high variate score. Then how is it possible for a dyad to have high values on both the conflictful and cooperative behavioral dimensions simultaneously? If we take a closer look at the inner structure of both the alliance and the penetration behaviors, we can understand this apparently peculiar combination of behavioral patterns. The highest loaded variable on the alliance dimension is treaties of friendship and foreign policy alignment (.91). China signs treaties of friendship on two different occasions. First, she signs them when she needs diplomatic help, usually from a member of the Communist bloc, to strengthen her position in the global international system. Second, China signs these treaties with those nations she wants to penetrate. Thus, the treaties may be regarded as a

prelude to other Chinese penetrative activities. Thus, in the second case, the counterpart nations overlap the target nations of liberation wars.

The penetration behavioral dimension had economic aid as the highest loading variable (.86). It is much easier, therefore, to understand that liberation war behavior can be combined with the penetration behavior pattern, since China's economic aid has a clear purpose of implanting pro-Chinese elements in the recipient nation.

If we pool together the three behavioral patterns on the left side of equation (23), then we can say that the combined pattern represents China's long-range campaign of global revolution, the first step of which is the exportation of communism in semi-colonial areas, i.e., "world rural areas" in their terminology.⁹¹ An alliance with the existing government, then, may be regarded as the first step of China's world revolutionary campaign; penetration with economic aid is the second step; and support of liberation war is the third step.

Now let us turn to the right side of equation (23). There are four elements in the combination: Chinese sphere (CHI), population density (DNS), neutralism (NEU) and population (POP). Among these Chinese sphere has the highest coefficient (.73). Although we named the dimension, Chinese influence sphere, for simplicity, there are three independent high loading variables: geography-X (.84), Chinese population (.82) and rainfall (-.68). This means that the nations located near the equator, which have many Chinese inhabitants and heavy rainfall will have high scores on the Chinese sphere together with the implications of the other three elements

⁹¹For detailed discussions of China's long range foreign policy of worldwide social revolution, see Winton, 1966, p. 119; Boyd, 1962, p. 84; Halpern, 1966, pp. 2-3.

(low population density, politically partisan, and big population), we can say that Southeast Asian nations will have the highest variate scores on the right-hand side pattern combination of the equation.

With the elements in the equation thus interpreted, we can say that China concentrates her world revolutionary efforts on relatively big, partisan, tropical, Asian-African-Latin American nations where many Chinese live.

The canonical correlation of the equation, however, is relatively low (.47). Only about one quarter of the total variance is explained by the pattern equation. A close examination of the canonical variate scores of all the dyads, however, shows why the model produced relatively low canonical correlations; there were a few extreme deviations, such as USSR-50, Indonesia-65, Guinea-65, and Venezuela-65. Except for these extreme cases, the prediction in general was fairly good, because most dyads have similar canonical variate scores on both sides of the equation.

Figure 13 plots the canonical variate scores for several selected dyads. Since the attribute distances included in the equations are all stable ones, i.e., have little variation across time (rainfall and geographical location are constant; population and population density change little in sixteen years), the movements of the dyads are limited to vertical directions parallel to the dependent variable axis. The degree of the shift, however, is so drastic that we can see that the model cannot help much to predict China's world revolutionary activities.

The fourth model we found relates to China's third world politics. The equation is

$$.63 \text{ ALI} - .60 \text{ LIB} \approx .63 \text{ NEU} + .52 \text{ MON} - .37 \text{ DEV} \quad (r=.38) \quad (24)$$

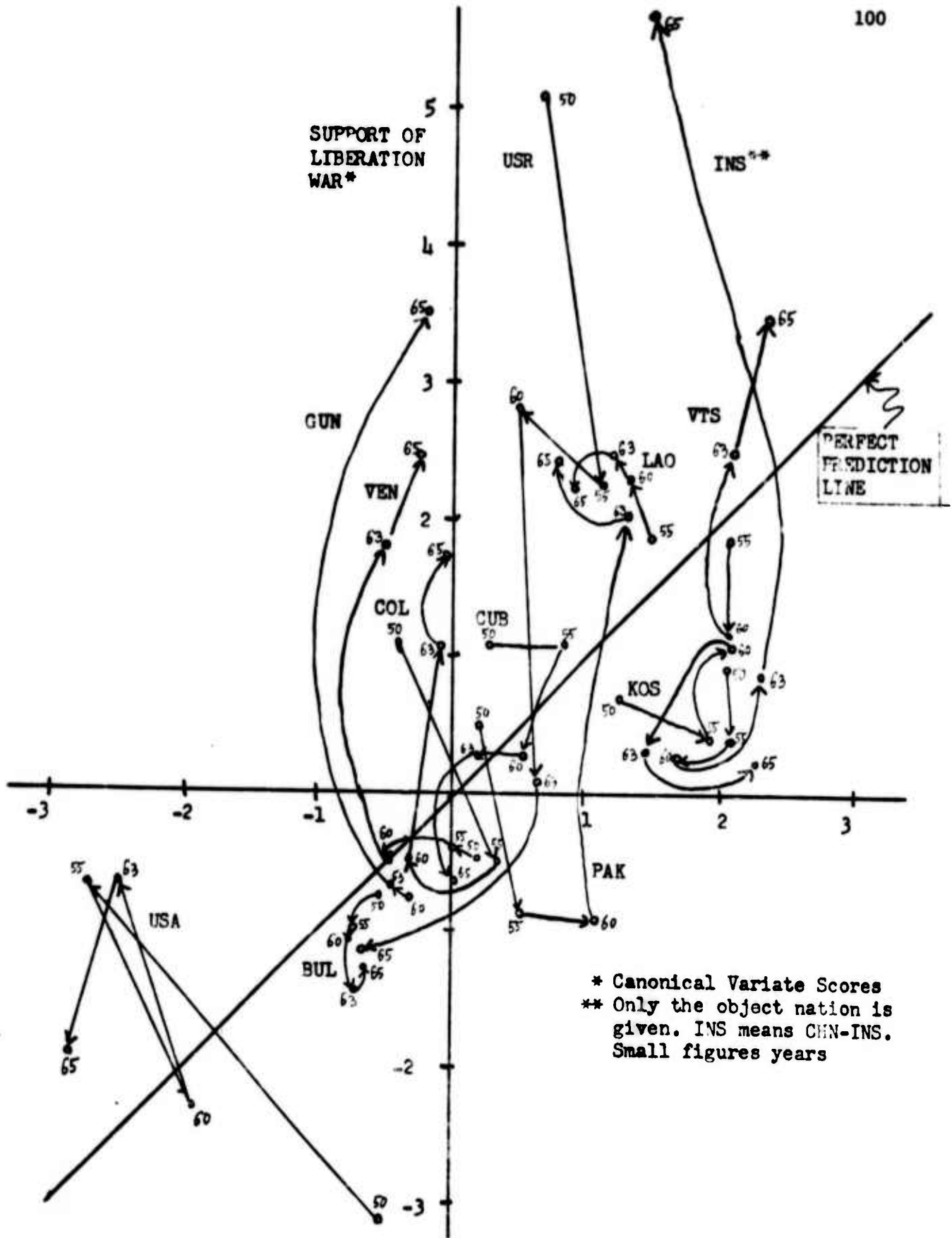


FIGURE 13

CHINA'S SUPPORT OF LIBERATION WAR

where MON stands for monarchy and DEV is economic development (the other symbols are the same as in the previous equations). The model tells us that when the object nation is a monarchy, politically neutral and economically underdeveloped, China tends to have alliance relationships and does not support its liberation wars. The fact that Afghanistan, Nepal, Burma, Cambodia all have high canonical variate scores on the behavioral side of the equation confirms the interpretation. The model actually tells us what type of nations among the third world enjoy good relations with China without becoming targets of China's world revolution activities.

The canonical correlation, however, is too low to make the model practical at this time. The heuristic value of the model should be recognized, however.

The last equation to be examined is the model for China's substantial cooperation pattern, which roughly says that China has strong substantial cooperative ties with Western Catholic nations. The equation for this model is

$$.74 \text{ SUB} - .36 \text{ PEN} - .35 \text{ ALI} - .32 \text{ CFL} = \\ .53 \text{ CAT} - .42 \text{ NEU} + .36 \text{ POP} + .30 \text{ MON} \quad (r=.34) \quad (25)$$

where SUB stands for substantial cooperation (mainly economic cooperation) and CAT is Catholic culture. The other symbols are the same as in the previous equations.

High loading variables on the Catholic culture dimension were geography-Y (-.88), distance from U.S. (-.84), percent Catholic population (.74), distance from Peking (.66). Thus, a nation which is located in the northern hemisphere, relatively close to the U.S. but far from Peking, and

has a high percentage of Catholics tends to have a high score on this dimension; i.e., the object nations are mainly European nations, such as the United Kingdom, Belgium, Norway, France, Italy and Germany.

China's behavior pattern defined by the combination of substantial cooperation, penetration, alliance and formal conflict with the attached signs in the model is a purely business-like behavior which emphasizes economic cooperation (trade), and de-emphasizes political interactions, favorable ones (aid, friendship treaties) as well as hostile ones (formal conflict).

The model implies that China wanted to keep good realistic transactions with developed European nations (world metropolitan areas) to sustain her economy, and in order to keep the door open, she made minimal gestures (positive communication, non-political visits).⁹² Beyond this level of transaction, China did not interact politically with those nations, either positively or negatively.

3.2 China's Cooperation, Conflict and Interaction and Status-Field Theory

In 4.2, we derived three hypotheses about China's cooperation, conflict and interaction, with the help of status-field theory. In summary, the hypotheses told us that 1) there is a behavioral dimension of the cooperative type which is linearly related to two status dimensions, power and economic development; 2) there is also a behavioral dimension of the conflictful type which can be explained by the linear combination of power and economic development distances; and 3) the combined degree of interaction, which is composed by summing the two behavioral dimensional

⁹²High loaded variables on the substantial cooperative behavior dimension are export (.88), positive communication (.67), non-political visit (.55).

scores discussed above with appropriate weights, is correlated mainly with power distance.

Now let us re-examine the five independent pattern models of the linkages between China's dyadic behavioral dimensions and her attribute distances from others.

Through the five models we identified five kinds of cooperative behavioral dimensions -- formal diplomacy, substantial cooperation, administrative cooperation, alliance, penetration -- which were involved as a part of the behavioral pattern combination in the models.

On the right-hand sides of the equations, however, only in one equation could we see power distance as a leading element in the combination of attribute distance dimensions. Economic development appears once in the fourth equation, but not as a leading element (regression coefficient was .37). Thus, we can say empirically that there is neither a status-dependent conflict behavior, nor is there cooperative behavior which is mainly dependent on economic development status differences. Furthermore, there was no equation which included both power and economic development together as prominent right-side elements.

Among the five models generated in this study the most relevant equation to the propositions of status-field theory is the second one which related China's formal conflict to power distance. Furthermore, both formal conflict behavior and power distance played leading roles on the right and left sides of the equation respectively.

Now let us examine the relations between the second equation (power politics pattern) and the relevant hypotheses of status-field theory. In order to do this, let us rewrite equation (22) including all elements with coefficients greater than .15.

$$\begin{aligned}
 & .89 \text{ CFL} - .31 \text{ DIP} + .19 \text{ LIB} + .19 \text{ SUB} - .15 \text{ PEN} \\
 & .85 \text{ POW} - .31 \text{ COM} + .24 \text{ CHI} + .21 \text{ POP} + .19 \text{ DCF} + .16 \text{ DEV} - .15 \text{ NUE} \quad (26) \\
 & \quad \quad \quad (r=.76)
 \end{aligned}$$

If we re-order the elements, we can see that this equation includes the two propositions of status-field theory -- the conflict theorem and the interaction theorem.

conflict theorem

$$.89 \text{ CFL} + R = .85 \text{ POW} + .16 \text{ DEV} + S \quad (27)$$

interaction theorem

$$.89 \text{ CFL} + .19 \text{ SUB} + P' = .85 \text{ POW} + S' \quad (28)$$

For the conflict theorem, the hypothesis of status-field theory was correct in the sense that China's formal conflict behavior is status dependent and is mainly dependent on power distance and economic development. We, however, found empirically that for China, economic development distance was not so important in determining the conflict level.⁹³

The interaction theorem was also substantiated in China's case. China's formal conflict behavior and part of her substantial cooperative behavior were found to be status dependent and this combination was largely dependent on power distance alone as we predicted. The only deviation was that a small part of the substantial cooperation, but not most of the cooperation, was power dependent.

How about the cooperation hypothesis which says that the more economically developed and the more powerful is the object nation, the

⁹³In status-field theory the parameters α and β are to be determined empirically.

more China's status-dependent cooperation behavior? If we scrutinize the five pattern equations, we can see that the relation specified by the hypothesis is buried in a non-status-dependent cooperation model in which the communism factor plays a predominant role. To see this, let us rewrite the first equation which we named China's bloc politics pattern, including the less important elements (coefficient is greater than .15). Then the equation is

$$.74 \text{ DIP} + .43 \text{ SUB} + .37 \text{ ADM} + .27 \text{ CFL} + .19 \text{ CMC} + .92 \text{ COM} + .31 \text{ POP} + .29 \text{ POW} + .24 \text{ CHI} + .16 \text{ DEV} \quad (r=.85) \quad (29)$$

which includes, again, the cooperative theorem as a part of the model

$$.43 \text{ SUB} + R = .29 \text{ POW} + .16 \text{ DEV} + S \quad (30)$$

where R consists mainly of other types of cooperation, and S is comprised largely of the communism factor. We can see that China's substantial cooperation is dependent on both power distance and economic development as predicted by the cooperation theorem of status-field theory, but other elements overwhelmed this relation. In retrospect, we know that the Cold War between the Communist Camp and Western Powers dominated the period between 1950 and 1965. As a member of the Communist Camp, China's cooperative behavior must have been strongly affected by bloc politics. The fact that China's cooperation was determined mainly by the communism factor and that the cooperative theorem of status-field theory was buried as a sub-model within this salient model is thus understandable.

IX. REVIEW AND CONCLUSION

A nation's foreign behavior is a conglomeration of various entangled human activities which are associated with innumerable causal factors. The complex interrelations among various aspects of foreign behavior has hindered the development of clear analytic models of the foreign behavior of a nation. China has added even greater complexity to the traditional behavioral patterns of the established Powers because she has crossed all the different power positions in the international hierarchy in a relatively short time; in less than two decades, starting from an embryonic stage of nation building and struggling for mere survival in a harsh international system, she has now achieved the super power position which enables her to lead and shape the international political environment.

One of the major purposes of this study was to reduce this complexity by producing some simple discernible pattern models that link sets of China's foreign behavior to her attribute similarities and differences from other nations. The results of the study were very encouraging. Guided by Rummel's field theory, we untangled China's foreign behavior into eight independent behavioral clusters and delineated eight corresponding linear models which clearly assert distinguishable relationships among behavioral patterns and attribute distance patterns. Among these eight models, five proved to be useful in explaining and predicting China's actual behavior. These were: the Chinese formal cooperation pattern comprised of diplomatic relations, substantial cooperation and administrative cooperation, which was explained by similarities and differences in bloc affiliation between China and other nations; the Chinese formal conflict pattern, measuring the Chinese level of manifested conflict behavior toward a nation, explained by power

distances; the Chinese support of liberation war pattern which linked the object nation's geographical affinity to China and commitment by the object nation to neutralism; the Chinese Third World Politics pattern, which distinguishes out of the developing nations, those enjoying amicable government-to-government relations with China; and the Chinese substantial cooperation pattern, which is explained by the combined characteristics of the object nation's cultural, geographical, political attributes. All of these pattern models were statistically significant and their predictive powers ranged from seventy-two percent to twelve percent of the variance in China's behavioral variables. Because three of the five have relatively low predicting power (less than twenty-five percent), we cannot argue that all the models can be applied. The identification of the basic pattern relations among the concepts included in the model, however, will guide us in building better theoretical models.

Another important aim of this study was to test three hypotheses about China's cooperation, conflict and interaction behavior deduced from status-field theory. The test results were unsatisfactory because they did not conform exactly to the hypotheses. Although all of the pattern relations predicted by the three status-field theory hypotheses actually were identified, the test results showed that the hypothesized pattern relations were all imbedded in a larger context of other pattern relations. In other words, they constituted parts of three of the five pattern models discussed above.

The cooperation hypothesis was subsumed in the formal cooperation pattern, where bloc affiliation played a leading role in explaining a set of three different kinds of Chinese cooperative behavioral patterns.

Distances on the power and economic development dimensions which, by hypothesis, were supposed to play major roles were now overshadowed by bloc politics.

The status-dependent conflict hypothesis which says that China's conflict behavior is a function of the weighted sum of both the power distance and the difference in economic development was now identifiable as a part of the Chinese formal conflict pattern. Power parity was the leading independent variable, as predicted, but economic development which also was expected to contribute much accounted for less than three percent of the total variance in Chinese conflict behavior.

And the third hypothesis, which proposed that the joint values of China's cooperation and conflict behavior was determined mainly by power distance alone, did not hold up in the data. China's formal conflict pattern involved little cooperative behavior, and a large portion of the variance in this conflict was determined by factors other than power distances.

Thus, it is difficult to say that the three hypotheses generated by status-field theory are confirmed by this study. However, it is encouraging that the predicted linear functions between the cooperative and the conflictful behavior on one side and power distances and differences in economic development on the other side of the equation could be identified empirically, even though as parts of other linear functions. The discovery of the linear functions specified by the theory implies that it is still possible to tackle complex reality with a linear approach, and the field theoretic models are on the right track.

One discouraging finding is the relatively low trace correlation produced by the eight canonical correlations between China's behavior

factors and her attribute distances. The trace correlation was .48 and it meant that only about twenty percent of the total variance contained in the behavioral data matrix was accounted for by the delineated eight linear pattern equations. Compared with several other studies of this kind,⁹⁴ the present finding is the lowest. For instance, a previous study which canonically correlated China's behavioral vectors with her attribute distances in a similar way for both 1955 and 1963⁹⁵ showed trace correlations of .72 and .70 respectively for each year. The only basic difference in the research designs of the two studies is that the current data matrix includes a cross-time variation as well as a cross-sectional variation, whereas the previous one included only a cross-sectional variation. Thus, we can infer that the low canonical correlation of the present study was due to cross-time variances. In other words, China's behavior toward a particular nation across the sixteen-year period did not vary as a function of corresponding attribute distances, as specified by the models of field theory. It may be argued that a nation's behavioral pattern toward an object nation probably has an inertial force and is not sensitive to all shifts in attribute distances, or that overwhelming political considerations produced extreme, deviant shifts in China's behavior toward a few nations (the Sino-Soviet dispute, the Sino-Indian war resulted in drastic changes in both the cooperation and the conflict dimensions), and as a result the deviations might have altered the general patterns. In either case, more thorough theoretical justification is needed to eventually improve the models.

⁹⁴Similar studies testing the field theory model with the canonical regression method are Rummel, 1971; Van Atta and Rummel, 1970; and Rhee, 1971.

⁹⁵See Rhee, 1971, p. 130, Table 12.

APPENDIX I

AXIOMS AND THEOREMS OF MUGHEL'S STATUS-FIELD THEORY

Axiom 1 (Status-field Axiom): International relations is a field consisting of all nations, the attributes and interactions and their complex inter-relationships through time.

Axiom 2 (Attribute-behavior Space Axiom): The international field comprises a Euclidean attribute space defining all the attributes of nations and a Euclidean behavior space defining all nation dyadic interactions.

Theorem 1 (Finite Dimensionality Theorem): A finite set of linearly independent dimensions generate attribute and behavior spaces.

Axiom 3 (Stratification Axiom): International relations is a stratified social system.

Theorem 2 (Status Theorem): Status dimensions are a subset of attribute space dimensions.

Definition 1 (Status Definition): A status dimension (of attribute space) is a continuum involving virtually universal international consensus as to which end is better or more desirable. An ascribed status dimension is one on which nations cannot alter significantly, their relative status in a generation. An achieved status dimension is one on which nations can so alter their location. A nation's rank is its total status on the status dimensions.

Corollary 1 (Status Measurement Corollary): Status is a continuous variable.

Definition 2 (Status Dimensions Definition): The international status dimensions are economic development and power.

Theorem 3 (Position Theorem): Nations are located as vectors in attribute space and as vectors of nation dyads in behavior space.

Corollary 2 (Status Position Corollary): An attribute space position defines a nation's relative status.

Theorem 4 (Mobility Theorem): Nations desire upward mobility.

Theorem 5 (Equilibration Theorem): Nations having unbalanced statuses desire to balance them.

Corollary 3 (Elite Corollary): A nation's elite identify with their rank and status configuration.

Definition 3 (Rank Definition): The rank of i is $\alpha_1 s_{i1} + \alpha_2 s_{i2}$, where α_1 and α_2 are positive parameters and s_{i1} and s_{i2} are nation i 's economic development and power statuses, respectively.

Definition 4 (Joint Rank Definition): The joint rank of two nations, i and j , is $\alpha_1(s_{i1} + s_{j1}) + \alpha_2(s_{i2} + s_{j2})$, where α_1 and α_2 are the positive parameters in Definition 3.

Definition 5 (Status Disequilibrium Definition): A nation's status disequilibrium is $\pm \alpha_1 s_{i1} \mp \alpha_2 s_{i2}$, where α_1 and α_2 have different signs.

Definition 6 (Status Incongruence Definition): The status incongruence of two nations i and j is $\pm \alpha_1(s_{i1} - s_{j1}) \mp \alpha_2(s_{i2} - s_{j2})$, where α_1 and α_2 have different signs.

Corollary 4 (Status Distance Corollary): Status incongruence between nations i and j is the distance vector between their status vectors on a status dimension.

Axiom 4 (Attribute Distance Axiom): Between nation attribute distances at a particular time are social forces determining dyadic behavior at that time.

Axiom 5 (Status Dependence Axiom): Some behavior dimensions are linearly dependent on status.

Definition 7 (Status Role Definition): The status dependent behavior dimensions define a nation's status role.

Definition 8 (Status Behavior Definition): The status dependent behavior dimensions delineate status behavior.

Axiom 6 (Rank Behavior Axiom): Status behavior is directed toward higher ranking nations and the greater a nation's rank, the more its status behavior.

Axiom 7 (Status-Quo Axiom): High rank nations support the current international order.

Theorem 6 (Cooperation Theorem): The higher the joint rank of nations i and j , the more cooperative their behavior. That is, $CO_{i+j} = -\alpha_{i1}d_{i-j,1} - \alpha_{i2}d_{i-j,2}$, where CO_{i+j} is a behavior space cluster of highly intercorrelated cooperation vectors.

Axiom 8 (Dominant Status Axiom): Nations emphasize their dominant status and the others' subordinate statuses in interaction.

Corollary 5 (Dissonance Corollary): Status disequilibrium causes cognitive dissonance.

Corollary 6 (Status Link Corollary): Common statuses between nations provide them with similar interests and a communication bridge.

Corollary 7 (Uncertainty Corollary): The more two nations are status incongruent, the more their relationships are uncertain and the more incongruent their expectations of each other's behavior.

Axiom 9 (Economic Development Status Axiom): The more similar in economic development status, the more nations are mutually cooperative.

Theorem 7 (Conflict Theorem): Two nations' status incongruence is correlated with their mutual status dependent conflict behavior.

Theorem 8 (Economically Developed Conflict Theorem): For economically developed actors, status dependent conflict behavior: $CF_{i \rightarrow j} = \alpha_{i1}^* d_{i-j,1} - \alpha_{i2}^* d_{i-j,2}$.

Theorem 9 (Economically Underdeveloped Conflict Theorem): For economically underdeveloped actors, status dependent conflict behavior $CF_{i \rightarrow j} = -\alpha_{i1}^* d_{i-j,1} + \alpha_{i2}^* d_{i-j,2}$.

Theorem 10 (Economically Developed Status Behavior Theorem): The status dependent cooperation and conflict behavior of high economically developed nations to others is a function of their

power incongruence, that is $CO_{i \rightarrow j} + CF_{i \rightarrow j} = -\gamma_2 d_2$, where CO is nation i to j cooperative behavior, CF is conflict behavior, γ_2 is a positive parameter equalling $(\alpha_2^* + \alpha_2)$, and d_2 is the i - j incongruence (distance vector) on the power status.

Theorem 11 (Economically Underdeveloped Status Behavior Theorem):

The status dependent cooperation and conflict behavior of economically underdeveloped nations to others is a function of their economic development incongruence, that is $CO_{i \rightarrow j} + CF_{i \rightarrow j} = -\gamma_1 d_1$, where CO is nation i to j cooperative behavior, CF is conflict behavior, γ_1 is a positive parameter equalling $(\alpha_1^* + \alpha_1)$, and d_1 is i - j incongruence (distance vector) on the economic development status.

Theorem 12 (Status Time Theorem): The status dependent behavior of nation i to j at time t is linearly dependent on their status distance vectors at time t .

Theorem 13 (Behavior Dependence Theorem): Behavior space is a subspace of attribute space.

APPENDIX II

LIST OF NATIONS INCLUDED IN THE ANALYSES

I.D.	Political Unit	Code Abbreviation	I.D.	Political Unit	Code Abbreviation	I.D.	Political Unit	Code Abbreviation
1.	Afghanistan	AFG 50*	30.	Germany (Fed. Rep.)	GMW 55	56.	Outer Mongolia	OUT 50
2.	Albania	ALB 50	90.	Ghana	GHA 60	57.	Pakistan	PAK 50
105.	Algeria	ALG 65	31.	Greece	GRC 50	58.	Panama	PAN 50
3.	Argentina	ARG 50	32.	Guatemala	GUA 50	59.	Paraguay	PAR 50
4.	Australia	AUL 50	91.	Guinea	GUN 63	60.	Peru	PER 50
5.	Austria	AUS 55	33.	Haiti	HAI 50	61.	Philippines	PHI 50
6.	Belgium	BEL 50	34.	Honduras	HON 50	62.	Poland	POL 50
7.	Bolivia	BOL 50	35.	Hungary	HUN 50	63.	Portugal	POR 50
8.	Brazil	BRA 50	36.	India	IND 50	64.	Romania	ROM 50
9.	Bulgaria	BUL 50	37.	Indonesia	INS 50	114.	Rwanda	RWA 65
10.	Burma	BUR 50	38.	Iran	IRN 50	65.	Saudi Arabia	SAU 50
113.	Burundi	BRN 65	39.	Iraq	IRQ 50	100.	Senegal	SEN 63
11.	Cambodia	CAM 55	40.	Ireland	IRE 50	204.	Sierra Leone	SIE 63
83.	Cameroon	CAO 63	41.	Israel	ISR 50	101.	Somalia	SOM 63
12.	Canada	CAN 50	42.	Italy	ITA 50	66.	Spain	SPN 50
84.	Central African Republic	CEN 63	92.	Ivory Coast	IVO 63	102.	Sudan	SUD 60
13	Ceylon	CEY 50	163.	Jamaica	JAM 65	67.	Sweden	SWD 50
85.	Chad	CHA 63	43.	Japan	JAP 55	68.	Switzerland	SWZ 50
14.	Chile	CHL 50	44.	Jordan	JOR 50	69.	Syria	SYR 50
15.	China	CHN 50	45.	Korea (Dem. Rep.)	KON 50	109.	Tanzania	TAZ 63
16.	China (Republic of)	CHT 55	46.	Korea (Rep. of)	KOS 50	70.	Thailand	THA 50
17.	Colombia	COL 50	80.	Laos	LAO 55	103.	Togo	TOG 63
87.	Congo (Brazzaville)	CUN 63	47.	Lebanon	LEB 50	216.	Trinidad	TRI 65
86.	Congo (Leopoldville)	COP 63	48.	Liberia	LIB 50	104.	Tunisia	TUN 60
18.	Costa Rica	CUS 50	49.	Libya	LIBY 55	71.	Turkey	TUR 50
19.	Cuba	CUB 50	93.	Madagascar	MAD 63	72.	Union of S. Africa	UNS 50
20.	Czechoslovakia	CZE 50	94.	Malaysia	MAL 60	73.	USSR	USR 50
88.	Dahomey	DAH 63	95.	Mali	MLI 63	74.	United Kingdom	UKR 50
21.	Denmark	DEN 50	96.	Mauritania	MAT 63	75.	USA	USA 50
22.	Dominican Republic	DOM 50	50.	Mexico	MEX 60	219.	Uganda	UGA 65
23.	Ecuador	ECU 50	97.	Morocco	MOR 60	105.	Upper Volta	UPP 63
24.	Egypt (UAR)	EGY 50	51.	Nepal	NEP 50	76.	Uruguay	URA 50
25.	El Salvador	ELS 50	52.	Netherlands	NTH 50	77.	Venezuela	VEN 50
26.	Ethiopia	ETH 50	53.	New Zealand	NEW 50	81.	Vietnam (N)	VIN 55
27.	Finland	FIN 50	54.	Nicaragua	NIC 50	82.	Vietnam (S)	VIS 55
28.	France	FRN 50	98.	Niger	NIR 63	78.	Yemen	YEM 50
89.	Gabon	GAB 63	99.	Nigeria	NIG 63	79.	Yugoslavia	YUG 50
29.	Germany (D.D.R.)	GME 55	55.	Norway	NOR 50			

* Figures indicate the year nations were first included in analysis.

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